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Contents

The Share Price Impact of UK CCA Disclosures	K. V. Peasnell L. C. L. Skerratt C. W. R. Ward	3
Revaluation of Fixed Assets in Accruals Accounting	John R. Grinyer	17
The Auditor, Third Parties and Contributory Negligence	D. R. Gwilliam	25
Experimental Research in Auditing: Field vs. Laboratory Settings	Keith A. Houghton Peter Robinson	37
The Search for Correspondence with Economic Reality: A Review Article	T. A. Lee	43
Signalling, Agency Theory and Accounting Policy Choice	Richard D. Morris	47
Some Further Empirical Evidence on Predicting Private Company Failure	M. J. Peel D. A. Peel	57
The Effects of Information and Cognitive Processes on Decision Making	Waymond Rogers Thomas J. Housel	67
Allocations and the Validity of the Incremental Principle	R. C. Skinner	75
Book Reviews		79
Contributors to this Issue		96

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P, 6005

The Share Price Impact of UK CCA Disclosures*

K. V. Peasnell, L. C. L. Skerratt and C. W. R. Ward

Abstract—This study investigates the impact of the experimental standard, SSAP16 (Current Cost Accounting), on share returns on the London stock market. Approximately 200 companies were examined between 1980-84. The experimental design specifies current cost as a supplementary signal to historical cost and employs two main statistical tools: ordinary least squares regression and the abnormal performance metric. In addition, a number of different CCA measurements are specified in order to assess the sensitivity of the results and to ease comparison with other studies. The results suggest that CCA information has a small but significant impact on stock returns in the days up to announcement. However, CCA does not seem to be the main driving force behind long period returns. Returns in the long run are associated more closely with historical cost information than with that generated by SSAP16.

Introduction

The relationship between share returns and current cost accounting (CCA) numbers has been the subject of considerable debate in professional, business and academic circles in recent years. Research on the topic has been further stimulated by major funding initiatives in both the USA and the UK. The majority of studies have found that there is apparently little or no association between share returns and CCA disclosures: see Beaver, Christie and Griffin (1980), Gheyara and Boatsman (1980), Beaver, Griffin and Landsman (1982), Beaver and Landsman (1983), Appleyard and Strong (1984), Board and Walker (1984a,b), Schaefer (1984), Matolcsy (1984), McDonald and Morris (1984), Brayshaw and Miro (1985a,b) and Murdoch (1986). In contrast, Lustgarten (1982), Bublitz, Frecka and McKeown (1985), Jennings (1986) and Skerratt and Thompson (1984) appear to have uncovered small but significant associations.

The present paper investigates the impact of the experimental standard SSAP16 (Current Cost Accounting) on returns in the London stock market, extending the study of Skerratt and Thompson (1984) in two ways:

1. The sample base is increased to cover approximately 200 companies between 1980-84.
2. The experimental design is varied so that the sample evidence can be more easily compared with the results of other studies.

The data set

The 208 sample companies were taken from de Zoete & Bevan's equity working list and were confined to the major industrial sectors falling within the scope of SSAP 16. Also, the companies were chosen only if they had reported current cost information in at least two of the accounting year ends 1980 through 1983.

Most of the accounting and stock price data used for this study are those recorded by Datastream. This is a commonly used service in the UK investment community and is one of the sources most likely to be used by active market agents. The sources of data on the other variables are:

1. The date of announcement, defined as the day when the preliminary statement of earnings is made. As in Skerratt & Thompson (1984, p. 315), this is assumed to be the same day as the declaration of final dividends. The source here is Extel News cards.

2. The market forecasts of HC earnings are taken from *Earnings Guide*, a monthly report of consensus forecasts. As noted in Skerratt & Thompson (1984, p. 316), these forecasts are simply age-weighted and, therefore, do not fully capture the extra attention paid by brokers to their last forecast prior to announcement. A further constraint is that of the 208 companies selected above, only 162 have their details listed in *Earnings Guide*.

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However, *Earnings Guide* was the only source of forecast data readily available for the whole sample period.

The 208 companies selected formed a representative sample of listed companies (the above omissions excepted), accounting for just over 50% of the total UK Stock Exchange equity market capitalisation as at 30 September 1983. As a further check, the coverage of our sample (based on the de Zoete & Bevan service) was compared with that provided by another major London stockbroking firm, Rowe and Pitman. There was a very high degree of correspondence, in terms of companies included in both samples. In only two sectors (Newspapers and Publishing, and Shipping and Transport) was there no commonality of company coverage.

Cross-sectional regression near announcement

1. CCA earnings per share measurements

Rationale

The experimental design underlying the results reported in this section is that employed by Skerratt & Thompson (1984) and is given first to facilitate comparison with our prior work. The assumption underlying the method is that the impact of current cost is likely to be small, at most, and only discernible near the announcement date. The reason offered for this assumption is as follows. A competitive securities market might be expected to experience some difficulty in shifting from one measurement system to another, for the following reason. Investors are concerned mostly with capital gains, which derive from anticipating changes in expectations of other investors. Many of the events which have been studied in the accounting literature (e.g. corporate profit forecasts) are of obvious significance to investors because their effects are expected to turn up in the historical cost income statement sooner or later. But since investors are unfamiliar with the CCA measurement system, it is difficult to see how they could realistically expect the expectations of others (and hence share prices) to be driven entirely by the new aggregation procedures for measuring corporate performance.

Following this line of reasoning, over a long holding period share price movements could be expected to be dominated by revisions of expectations of historical cost measurements; and, as Taylor (1984) shows, stockbrokers' forecasts of HC earnings consistently improve throughout the 12 months prior to announcement date. As the announcement date approaches, the marginal gains from further revisions of the HC profit forecasts decline; attention will increasingly turn to

the other determinants of share price, perhaps including CCA earnings. A corollary of this is that the impact of CCA should be small; power problems are bound to plague investigations in this area.

Earnings per share measures of CCA income may be appropriate because they are widely reported measures of performance. Although per share calculations have well-documented weaknesses, they may be cost-effective measurements for investors wishing to make marginal adjustments to their portfolios. A major weakness with an earnings per share variable is that cases are excluded where earnings are negative; this issue is taken up below.

Another choice in the research design is to specify a benchmark to which the disclosed value of current cost EPS can be related. On the basis of our discussions with market agents, it seems clear that very few resources are devoted to anticipating current cost information. This is further evidenced by the scant attention paid to it in many stockbrokers' monthly reviews and recommendations; support for this limited role of current cost disclosures is reported in Carsberg and Day (1984). Consequently, in our study, forecasts of current cost earnings are not constructed; the benchmark chosen is the previous year's figure for current cost earnings, since it is a nil-cost forecast (and also an efficient one if CCA earnings follow a random walk).

Finally the return on the market is included in the model in order to eliminate a nuisance variable which might otherwise generate spurious results. The procedure we adopt here is rough and ready, assuming that all companies tend to move in step with each other. Although this assumption is obviously unrealistic, recent simulation studies by Dyckman, Philbrick and Stephan (1984) and Brown and Warner (1980, 1985) suggest that specification decisions in this area are not crucial. The power of tests to identify market reaction depends much more on the accuracy with which event dates can be determined (an aspect of research design to which we have paid great attention). We have heeded this advice in the expectation that a simple approach to controlling for market movements may be sufficient.

Definition of Variables

R_{jk} = the return on share j , measured over k days up to and including the announcement day

$$= (P_{jo} - P_{j,-k})/P_{j,-k}, \text{ where } \quad (1)$$

P_{jo} = the closing price of share j on the day of announcement

$P_{j,-k}$ = the closing price of share j , k days prior to announcement

R_{jnk} = the return on the FT-Actuaries All Share Index measured over k days up

to and including the announcement day of company j (2)

HCE_{jo} = the error in the consensus forecast of company j 's pretax profits, as revealed in its profits announcement on day 0
 $= (PTP_{jo} - CF_{jo})/CF_{jo}$, where (3)

PTP_{jo} = disclosed pretax profits, as recorded in *Earnings Guide*

CF_{jo} = the latest consensus forecast prior to announcement, as recorded in *Earnings Guide*

CCA_{jo} = the annual proportionate increase in CCA net earnings per share, disclosed on announcement day
 $= (CC_{jo} - CC_{j*})/CC_{j*}$, where (4)

CC_{jo} = CCA net earnings per share (Data-stream 251) disclosed on announcement day

CC_{j*} = CCA net earnings per share (Data-stream 251) for the previous accounting period.

The Model

$$R_{jk} = a_k + b_k \cdot R_{jmk} + c_k \cdot HCE_{jo} + d_k \cdot CCA_{jo} + U_{jk} \quad (5)$$

where U_{jk} is the error term, subscript k indexes each separate regression and j indicates the observation.

The Results

Table 1 gives the results of regressing stock returns up to announcement on the following

Table 1
Regressions of share return over k days up to announcement, for the reporting years 1981–1983

Estimates of

$$R_{jk} = a_k + b_k \cdot R_{jmk} + c_k \cdot HCE_{jo} + d_k \cdot CCA_{jo} + U_{jk}$$

over $k = 1, 5, 10, 15, 25, 35$ days
 up to announcement

k	b_k	c_k	d_k	No. of cases	R^2
1	1.25*	0.12*	0.004	301	0.16
	(4.3)	(5.9)	(1.7)		
5	0.98*	0.13*	0.008*	301	0.24
	(6.8)	(6.0)	(2.9)		
10	0.92*	0.10*	0.01*	300	0.21
	(7.5)	(3.6)	(2.99)		
15	1.09*	0.12*	0.009*	300	0.25
	(9.2)	(3.7)	(2.2)		
25	1.08*	0.13*	0.01*	280	0.20
	(7.3)	(3.1)	(2.2)		
35	1.20*	0.15*	0.02*	200	0.29
	(8.0)	(2.9)	(2.8)		

Note: * statistically significant at 5%.

Figures in parenthesis denote t statistics.

variables: the market index, the historical cost forecast error, HCE_{jo} , and the annual proportionate change in current cost earnings per share, CCA_{jo} . The model was estimated several times, over holding intervals of 1, 5, 10, 15, 25 and 35 days up to announcement.

The tests identify a share price effect for both the historical cost and the current cost information. The HCE variable is always significant at 5%. The CCA variable is significant at 5% for all holding intervals, with the single exception of the day of announcement. The CCA coefficients are much smaller in size than those for HCE ; this is consistent with the hypothesis that current cost earnings have less impact on prices than do historical cost profits. Sight should not be lost of the fact that, whereas the historical cost forecast error (HCE) is measured by reference to forecasts published in the last few weeks before announcement, the current cost forecast error (CCA) is calculated by reference to a 'forecast' established one year ago (last year's earnings). It could be that investors use more up-to-date and efficient forecasts than is assumed in the research design (an errors in variables problem), making the reported CCA coefficients difficult to interpret. This noted, the coefficients show that a 1% increase in return over 35 days could be generated either by a 7% historical cost forecast error or by a 50% increase in CCA earnings.

Table 1 does not report the results for all the specifications in Skerratt & Thompson (1984). In that study, experiments were conducted with two benchmarks for measuring the impact of current cost disclosures: (a) the previous year's value of current cost as reported in our Table 1, and (b) the contemporaneous value of historical cost earnings. Their results were not sensitive to this choice. In this present study, however, the use of the second benchmark, yielding the ratio of current cost to historical cost earnings per share, did not explain any of the variation in security returns across the sample.

The coefficients on the market index are significant and take plausible values, thereby justifying its inclusion in the model. A further refinement to the specification in equation (5) was to weight the FT index by the firm's sensitivity to market changes (systematic risk or beta),¹ thereby allowing for cross-company variation. This new variable was incorporated in two ways: first, as an independent variable along with HCE_{jo} and CCA_{jo} .

¹The beta measure of share j 's systematic risk was obtained by regressing R_j on R_m for the 26 weeks prior to the announcement of the 1982 results. No allowance was made for any effect of non-synchronous trading. Dyckman *et al.* (1984) and Jain (1986) suggest that such refinements to beta estimation do not improve the ability to detect the presence of market reaction. Since the two studies employed quite different techniques for identifying market reaction, their findings may transfer to the methodologies employed here.

and, secondly, by deducting it from the dependent variable R_{jk} .² The results were not substantially affected, with the exception that a CCA effect on the day of announcement was identified by both variations. These results are not given here but are available in Peasnell, Skerratt and Ward (1986), as are other sensitivity tests referred to, but not reported for space reasons, in various parts of the paper.

2. CCA pre-tax profits

Rationale

This experiment addresses the possible errors introduced above by measuring current cost impact in terms of proportionate change in earnings per share. One weakness with this specification is that Datastream does not report negative EPS numbers. Consequently, there would be missing values for the specification given above if either the current or the previous year CCA EPS were negative. Given that CCA earnings are more likely to be negative than the corresponding HCA number (since CCA earnings is less than or equal to its historical cost counterpart, by construction) this is potentially a serious problem; the measurement basis may capture only a limited part of the variation in current cost earnings.

Furthermore, the previous specification, in effect, deflates the change in CCA earnings by the CCA earnings of the previous period and this can produce volatile results when earnings are low. The variables have to be deflated, of course, otherwise large companies will have an undue influence on the regression results. Since Lustgarten's (1982, Table 1) works suggests that the choice of deflator might be critical, we have tested the sensitivity of the results in this respect, as follows.

In the experiment reported below pre-tax CCA profits were employed to capture year to year changes. Scaling was effected by dividing by CCA capital employed, thereby expressing the CCA surprise variable as essentially the difference between one year's and the preceding year's CCA return on capital employed.

²Beaver (1987) has cautioned that, when such market residuals are regressed against firm specific accounting variables, the parameter estimates are downward biased. On the other hand, a strength of working with residuals is that it is easy to identify the amount of the variation in returns associated with the accounting variables. The incremental explanatory power of the accounting variables (as measured by R^2) when the market effect is removed prior to carrying out the regression is of course lower than those reported in Table 1, and the decline increases the longer the holding interval. This can be deduced even from Table 1, since the high 't'-values for the market variable are indicative of its explanatory power.

Definition of Additional Variables

The definitions adopted are those in equations (1), (2) and (3) with the addition of the following definition for current cost:

$$\begin{aligned} CCR_{jo} &= \text{annual change in current cost return} \\ &\quad \text{on capital} \end{aligned} \quad (6)$$

$$\begin{aligned} CCPT_{jo} &= \text{current cost pretax profits disclosed} \\ &\quad \text{on day 0 (Datastream 230)} \\ &= \text{HC pre-tax profit less CCA operating} \\ &\quad \text{profit adjustments (for depreciation,} \\ &\quad \text{cost of sales and monetary working} \\ &\quad \text{capital), plus the CCA gearing adjust-} \\ &\quad \text{ment and associates' CCA pre-tax} \\ &\quad \text{profits, less interest expense} \end{aligned}$$

$$CCPT_{j*} = \text{current cost pre-tax profits for the} \\ \text{previous accounting period}$$

$$CCE_{jo} = \text{current cost capital employed, calcu-} \\ \text{lated by de Zoete and Bevan.}$$

The Model

$$\begin{aligned} R_{jk} &= a_k + b_k \cdot R_{jm} + c_k \cdot HCE_{jo} \\ &\quad + d_k \cdot CCR_{jo} + U_{jk} \end{aligned} \quad (7)$$

where U_{jk} is the error term, subscript k indexes each separate regression and j indicates the observation.

The Results

Table 2 gives the results of regressing stock returns up to announcement on the market index, the historical cost forecast error and the annual change in current cost rate of return. As in Table 1 the model was estimated several times over

Table 2
Regressions of share return over k days up to
announcement, for the reporting years 1981-83

Estimates of
 $R_{jk} = a_k + b_k \cdot R_{jm} + c_k \cdot HCE_{jo} + d_k \cdot CCR_{jo} + U_{jk}$
 over $k = 1, 5, 10, 15, 25, 35$ days
 up to announcement

k	b_k	c_k	d_k	No. of cases	R^2					
				1	5	10	15	25	35	
1	1.27*	0.016*	0.003	322	0.09	(4.05)	(3.55)	(0.04)		
5	0.92*	0.022*	0.18*	322	0.18	(6.12)	(4.41)	(2.41)		
10	0.97*	0.023*	0.25*	321	0.22	(7.64)	(3.82)	(2.87)		
15	1.06*	0.020*	0.38*	321	0.23	(8.32)	(2.93)	(3.77)		
25	1.07*	0.028*	0.42*	298	0.21	(6.86)	(3.34)	(3.36)		
35	1.24*	0.037*	0.48*	220	0.28	(7.36)	(3.88)	(3.26)		

Note: * statistically significant at 5%.
 Figures in parenthesis denote t statistics.

holding intervals of 1, 5, 10, 15, 25 and 35 days up to announcement. The results are similar to those based on earnings per share measurements reported in Table 1, identifying a share price effect by both the historical cost and the current cost information. The most striking difference between the two sets of results is that the size of the coefficient on the historical cost forecast error is reduced; the coefficients show that a 1% increase in share returns over 35 days would be generated by either a 27% forecast error or by a 2% increase in the CCA return on capital. Needless to say, interpretation of the coefficients is not straightforward since the two accounting variables are measured differently, the historical cost one being scaled by forecast profits and the current cost one by capital employed. Since capital employed is usually far greater than profit, it follows that the current cost variable is likely to be much smaller than the historical cost variable. Consequently, the relative magnitude of the two coefficients is not an indication of their relative importance. The increase in the coefficient on the current cost variable (relative to Table 1 which employs proportionate changes in CCA earnings per share) is to be expected, and is not necessarily a sign of its greater importance in this model.³

In addition, the robustness of the results to various measurement issues in equation (7) was examined. First, the measurement of the market variable was modified by weighting the FT index by the firm's beta. As before the new variable was incorporated into the estimating equation in two distinct ways: as an independent variable along with HCE_{jo} and CCA_{jo} (i.e. beta times the return on the market index) and also by deducting it from the dependent variable R_{jk} . Secondly, the deflator for the absolute change in CCA pre-tax profits ($CCPT_{jo} - CCPT_{j*}$) was varied. The additional measures employed were (a) Sales, (b) Historical Cost Capital Employed and (c) Equity Capital and Reserves. No substantial differences from the general picture reported in Table 2 were observed.

Finally, share returns on announcement day were scaled by both standard and mean absolute deviations with no substantial difference in the results. These results are available separately upon request.

³Some idea of what is involved can be obtained by considering the following simple example. Suppose the ratio of historical cost forecast to current cost capital employed (CF_{jo}/CCE_{jo}) averages about 20%. Assuming neither scaling variable contributes explanatory power to the model (i.e. they are indeed pure scaling variables), then the effect of scaling the CCA variable by the historical cost forecast rather than by capital employed should be to decrease the CCA coefficient given in Table 2 by 80%. In this case, it would take a 10% increase in current cost profit to generate a 1% increase in share returns.

3. CCA profit adjustments

Rationale

It should not be overlooked that the HCA and CCA profit variables are intertwined in the sense that CCA profit is equal to HC profit less CCA operating profit adjustments (for depreciation, cost of sales and monetary working capital), plus the CCA gearing adjustment and associates' CCA profits. In forecasting CCA profits it is clearly sufficient to forecast these adjustments and then subtract them from the HCA forecast.

We tried to capture this market process by regressing R_j on the following variables: the return on the market index, the historical cost forecast error and our estimate of the CCA adjustments.

Definition of Additional Variables

$$\begin{aligned} A_{jo} &= \text{historical cost earned for ordinary} \\ &\quad (\text{Datastream 182}) \text{ less current cost earnings} \\ &\quad (\text{Datastream 234}) \\ &= \text{the CCA adjustments} \end{aligned}$$

$$\begin{aligned} ACC_{jo} &= \text{the annual proportionate change in} \\ &\quad \text{CCA adjustments} \\ &= (A_{jo} - A_{j*})/A_{j*}, \text{ where} \end{aligned} \quad (8)$$

$$A_{j*} = \text{the CCA adjustments for the previous} \\ \text{accounting period}$$

The Model

$$\begin{aligned} R_{jk} &= a_k + b_k \cdot R_{jmk} + c_k \cdot HCE_{jo} \\ &\quad + d_k \cdot ACC_{jo} + U_{jk} \end{aligned} \quad (9)$$

where U_{jk} is the error term, subscript k indexes each separate regression and j indicates the observation.

Table 3
Regressions of share return over k days up to announcement, for the reporting years 1981-83

k	Estimates of				No. of cases	R^2
	b_k	c_k	d_k	up to announcement		
1	1.51*	0.015*	-0.002	(-1.4)	248	0.12
	(4.3)	(3.3)				
5	1.01*	0.023*	-0.003*	(-2.3)	248	0.20
	(5.8)	(4.7)				
10	1.04*	0.025*	-0.004*	(-2.4)	247	0.23
	(7.0)	(4.2)				
15	1.03*	0.025*	-0.003	(-1.6)	247	0.18
	(6.7)	(3.5)				
25	1.17*	0.034*	-0.0001	(0.0)	231	0.18
	(6.4)	(4.1)				
35	1.30*	0.043*	0.000	(0.08)	178	0.25
	(6.6)	(4.5)				

Note: * statistically significant at 5%.
Figures in parenthesis denote t statistics.

The Results

Table 3 shows the parameter estimates of equation (9) in which share return over k days up to announcement is regressed on market return, the historical cost forecast error and the annual proportionate change in current cost adjustments. The estimates of the historical cost effect are very close to those in Table 2, and with one exception are more significant. The current cost coefficients have the correct signs, but are statistically significant over 5-day and 10-day holding periods only. Moreover, the magnitude of the coefficients of the ACC variable are very small, suggesting that the impact on share returns is minute. For example, whereas a 40% HCA forecast error will generate a 1% increase in share returns over the ten days prior to announcement, a 250% decline in current cost adjustments is needed to have the same effect.

Two types of sensitivity check were carried out. Firstly, the deflator for the absolute change in the CCA adjustments ($A_{j_0} - A_{j_*}$) was varied. Instead of the previous period's adjustments (A_{j_*}), we employed CCA capital employed (CCE_{j_0}) and Sales; in both cases the CCA effect completely disappeared, leaving the historical cost forecast error significant for all holding periods. Secondly, the market variable was modified by weighting the FT index by the firm's beta and incorporated into the estimating equation as before; this modification was performed on both the model in Table 3 (equation 9) and also on the alternative deflators for the CCA adjustments. In all cases, this adjustment increased the number of holding periods in which a CCA effect could be identified; typically the CCA variable was significant over 1, 5, and 10 days up to announcement. This confirms the findings of Dyckman, Philbrick and Stephan (1984) and Brown and Warner (1980, 1985) which suggest a slight preference for the market model; although the increased power of the market model over the market-adjusted returns model may be small, it seems to be sufficiently important for the small signals considered in this section.

Finally, an attempt was made to measure the adjustments directly rather than by deducting CCA profit from HC profit. However, there was a very large number of omissions of the relevant variables from Datastream. Not surprisingly, therefore, the results were unstable and are not reported for this reason.

4. Statistical diagnostics

Heteroscedasticity

Regression analysis assumes that each residual error term, U_{jk} , is identically and independently distributed. Since market conditions tend to affect groups of firms in a similar fashion, a substantial amount of event clustering in the sample is poss-

ible; in such a case the observed regression residuals will not represent independent drawings. Although the regression coefficients will still be unbiased and consistent, the OLS estimated standard errors of the coefficients will be biased and consequently the conventional significance tests will be invalidated. The evidence on the potential errors caused by this problem is mixed. Brown and Warner suggest that tests which ignore the problem can be well specified; indeed on the basis of their simulations carried out using actual share price data, Brown and Warner (1985, pp. 20-21) state that '... dependence adjustment can actually be harmful compared to procedures which assume independence'. In contrast, the simulations of Dyckman, Philbrick and Stephan (1984) indicate that event clustering reduces the power of the tests. It should be noted, however, that none of the statistical methods examined in the simulation tests carried out by Brown and Warner and by Dyckman *et al.* corresponds exactly to those used in the present paper.

The announcement dates used in this study are spread over some four calendar years; consequently heteroscedasticity is not expected to be a major problem. However, it is well known that accounting year ends are not randomly spread throughout the calendar year; there could be some event clustering in isolated pockets of the sample space. A number of tests were conducted to detect the presence of heteroscedasticity by examining the rank correlations between the absolute value of U_{jk} and some specified variables which could be associated with the problem.

First, a check for heteroscedasticity was made on the basis that it could be generated by infrequent trading. If trading is infrequent, observed returns may incorporate price adjustment delays (Theobald and Price, 1984); consequently the variance of the error term in the regression model may be larger for small and infrequently traded companies. In order to examine the extent of this problem, the absolute values of U_{jk} , obtained from the regressions reported in Table 1, were rank correlated with a proxy variable for firm size (the inverse of sales), with a positive sign suggesting thin trading heteroscedasticity. As shown in Panel A of Table 4, the tests generated no significant results. Since the firms included in the sample are larger than average, these results are to be expected; thin trading is not likely to be a problem.

Secondly, rank correlations were calculated between the absolute values of U_{jk} from each of Table 1's regressions and each of the independent variables. The results given in Panel A of Table 4 indicate some slight heteroscedasticity related to the CCA variable for short holding intervals. The same tests were conducted (but not reported in this paper) for equations (7) and (9) estimated in Tables 2 and 3; a small amount of heteroscedasticity was

Table 4
Statistical diagnostics on regression equation (5)
estimated in Table 1

$$R_{jk} = a_k + b_k \cdot R_{jmk} + c_k \cdot HCE_{jo} + d_k \cdot CCA_{jo} + U_{jk}$$

Panel A: Heteroscedasticity tests

Rank correlation of absolute U with:

k	$(Sales)^{-1}$	R_{jmk}	HCE_{jo}	CCA_{jo}
1	0.01	0.00	0.04	-0.12*
5	0.00	0.08	-0.04	-0.13*
10	0.07	0.00	-0.06	-0.05
15	0.09	0.00	0.01	-0.02
25	0.10	0.07	-0.10	-0.03
35	0.10	0.05	-0.11	0.00

Panel B: Correlation Matrix (zero order) of R_{jk} , R_{jmk} , HCE_{jo} & CCA_{jo} : $k = 1$

R_{jk}	1.0			
R_{jmk}	0.20*	1.0		
HCE_{jo}	0.30*	-0.11	1.0	
CCA_j	0.14*	0.06	0.10	1.0
R_{jk}	R_{jmk}	HCE_{jo}	CCA_j	

Note: * statistically significant at 5%.

again detected but associated this time with the historical cost forecast error, over holding periods of 25 and 35 days.

Although the size of the cross-section correlation in the absolute residuals was small, the number of instances exceeded what would be expected if the true correlations were zero. Lustgarten (1982, p. 138) also reports such a problem. The way out is not at all clear. Lustgarten suggests a time-series approach, but the stationarity that this requires before the announcement is not always available, thereby reducing the sample size. Sefcik and Thompson (1986) have developed a mechanism to correct the estimating equation based on the variables associated with the cross-section collinearity. However, the observed correlations may also be the consequence of a fundamental model misspecification. The theoretical justification for the additive variable model specification employed in the present study and elsewhere has not yet been addressed by researchers. Following this line, we reformulated the CCA variable as the difference between the proportionate changes in current and historical cost net earnings per share. This produced estimates free from heteroscedasticity but with no other substantial differences from the general picture in Tables 1 to 3 and so the results are not reported here.

Multicollinearity

Since current cost earnings are obtained by making various adjustments to the historical cost figure, a strong association between the two is to

be expected. A number of studies have addressed the substantial issue of disentangling the two effects from each other, such as Beaver, Griffin and Landsman (1982) and Christie, Kennelley, King and Schaefer (1984). In our study, multicollinearity was not anticipated to be a problem. We have suggested that market agents might turn to current cost only when the marginal gains to revisions of the historical cost forecast are small. This means that any CCA effect is observed only when most of the HCA information has been impounded. Consequently on *a priori* grounds it is argued that there is unlikely to be much collinearity between the two signals at the time of any CCA impact.

Panel B of Table 4 shows the zero-order correlation matrix for the variables in equation (5) which expresses share return as a function of market return, the historical cost forecast error and the annual proportionate change in current cost earnings per share. As expected, there is little or no association between the CCA and HCA signals. The matrix was also calculated for the other models estimated in this section. Although sometimes statistically significant, the correlation coefficients were always very small (relative to the size when multicollinearity is an estimation problem), of the order of 0.20 to 0.30. These results are available upon request.

Abnormal performance index

Rationale

The experimental design employed in this section is the Abnormal Performance Index (API) metric. The index measures, over time, the pay-off to investing £1 in a chosen portfolio. When using this method to identify the impact of earnings announcements, several portfolios are constructed according to the size of the earnings forecast error. The relative performance of the indices up to the day of announcement then measures the incremental gains which are possible from advance knowledge of the earnings number. In recent simulation studies Brown and Warner (1985) have shown that, when daily data are used, the API can provide a robust and powerful tool for event studies. As above, we adopt a relatively simple approach to market movements, using market adjusted returns ($R_j - R_{jm}$) rather than the residuals from the OLS market model.

The tests reported below monitor excess returns from 19 days before to 5 days after announcement. Portfolios are constructed using the annual proportionate change in current cost net earnings per share and the historical cost consensus forecast error. Market estimates of current cost earnings were not employed in the tests for the reason given above, namely that there is little evidence of their construction by the majority of market agents. This contrasts with the approach of Brayshaw and

Miro (1985b) who employ Philips and Drew estimates.

Definition of Variables

R_{jt} = the return on share j for period t

R_{mt} = the return on the FT Actuaries All Share Index for period t

$$E_{ij} = R_{jt} - R_{mt}$$

HCE_{jo} = the consensus forecast error as in equation (3)

CCA_{jo} = the proportionate change in CCA earnings as in equation (4)

n = the number of observation sets

The Performance Statistic

API_T = Abnormal Performance Index for day T ($T = -19, \dots, +5$)

$$= \sum_{j=1}^n 1/n \prod_{t=-19}^T (1 + E_{jt}) \quad (10)$$

API_T measures the cumulative pay-off, over $19 + T$

days, from investing £1 in the portfolio of shares in question.

The Results

Two sets of results are presented, showing the effect of two partitioning schemes. Firstly, in Table 5 the API is partitioned by the sign of the proportionate change in current cost earnings. Then, in Table 6, the data are partitioned by both current cost earnings and the historical cost forecast error.

Table 5 shows the impact of current cost information beginning about 3 days prior to disclosure. By the day of announcement, there is a 3% difference in the value of the two portfolios. There seems to be little movement after the announcement. The problem with this evidence is that the groups are contaminated with other effects, particularly with the influence of historical cost information. The methodology tries to accommodate this by the averaging process; but it does not deal effectively with a situation in which there is some correlation between the signals.

In order to meet this problem the sample was partitioned by both historical cost forecast error and current cost change. The results are given in Table 6. It can be seen that an apparent incremental impact of current cost is identified, about 4 days prior to disclosure. Columns (1) and (2) show the effect of CCA earnings when the historical forecast error is non-negative; there is a 3% difference between the portfolios. However, columns (5) and (6) show the absence of a CCA effect when the historical cost forecast error is negative.⁴ When there is good news on the basis of historical cost, the market appears to distinguish further between securities on the basis of current cost. But, in the case of historical cost bad news, no further discrimination occurs. These results are consistent with a rational expectations framework. Since no company wants to publish bad news, if bad news appears then something bad has happened; the converse need not apply and therefore investors might seek further information such as the current cost statements.

Further insight can be gained by comparing columns (1) with (5), and (2) with (6), i.e. by

⁴Of course, it is possible that such coarse control may still not deal effectively with collinearity between the two signals; the observed differences between columns (1) and (2) may be due to the variation in HCE which itself is highly correlated with the CCA signal. However, it can be seen from Panel B of Table 4 that the correlation coefficient between the two variables is low, approximately 0.10. Moreover, when CCA is regressed on HCE the constant term is positive (0.186) and significant at 0.0005; consequently, significant positive correlation between HCE and CCA would mean a paucity of cases when HCE is non-negative and CCA is negative. The fact that column (2) contains approximately one third of the sample indicates that coarse partitioning is not a serious problem. The corollary of this is that the partitioning in columns (5) and (6) could be inadequate; but no CCA effect is observed here.

Table 5
Abnormal Performance Index between day -19 and day $+5$, for the reporting years 1981–83

Cases	<i>Mann</i>		<i>t</i>	<i>Whitney Statistic</i>
	$CCA_{jo} \geq 0$	$CCA_{jo} < 0$		
DAY	197	124	—	—
-19	1.00	0.99	—	0.78
-18	1.00	1.00	—	0.13
-17	1.00	1.00	—	0.14
-16	1.00	1.00	—	0.21
-15	1.00	1.00	—	0.90
-14	1.00	0.99	—	1.04
-13	1.00	0.99	—	1.43
-12	1.00	0.99	—	1.70
-11	1.00	0.99	—	2.00
-10	1.00	0.99	—	1.59
-9	1.00	0.99	—	1.49
-8	1.00	0.99	—	1.69
-7	1.00	0.99	*	1.52
-6	1.01	0.99	—	1.41
-5	1.01	1.00	*	1.56
-4	1.01	0.99	*	1.89
-3	1.01	0.99	*	2.03
-2	1.01	0.99	**	2.58
-1	1.02	1.00	**	2.64
0	1.03	1.00	**	3.32
1	1.03	1.00	**	3.10
2	1.03	1.00	**	3.35
3	1.03	0.99	**	2.96
4	1.03	1.00	**	3.09
5	1.03	1.00	**	2.88

Note 1: the t statistics are calculated on the assumption of equal variance in the two populations.

Note 2: * indicates that the Mann-Whitney U test is significant at 5%. ** indicates that the Mann-Whitney U test is significant at 2%.

Table 6
Abnormal Performance Index between day -19 and day +5 for the reporting years 1981-83

Cases	Mann						Mann			
	$HCE_{jo} \geq 0$		$HCE_{jo} \geq 0$		Whitney		$HCE_{jo} < 0$		Whitney	
	$CCA_{jo} \geq 0$	$CCA_{jo} < 0$	$CCA_{jo} \geq 0$	$CCA_{jo} < 0$	U	t	$CCA_{jo} \geq 0$	$CCA_{jo} < 0$	U	t
DAY	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
-19	1.00	0.99	—	0.50	1.00	0.99	—	—	1.28	
-18	1.00	1.00	—	0.70	1.00	0.99	—	—	1.36	
-17	1.00	1.00	—	0.76	1.00	0.99	—	—	0.55	
-16	1.00	1.00	—	0.23	1.00	0.99	—	—	0.26	
-15	1.00	1.00	—	0.60	1.00	1.00	—	—	0.14	
-14	1.00	1.00	—	0.55	1.00	0.99	—	—	0.46	
-13	1.00	0.99	—	1.36	1.00	0.99	—	—	0.29	
-12	1.01	0.99	—	1.91	0.99	1.00	—	—	0.10	
-11	1.01	0.99	—	1.93	0.99	0.99	—	—	0.92	
-10	1.01	0.99	—	1.41	1.00	0.99	—	—	0.12	
-9	1.01	0.99	—	1.57	0.99	1.00	—	—	0.94	
-8	1.01	0.99	—	1.57	1.00	0.99	—	—	0.11	
-7	1.01	0.99	—	1.84	1.00	1.00	—	—	0.60	
-6	1.01	1.00	—	1.51	1.00	1.00	—	—	0.67	
-5	1.02	1.00	—	1.71	1.00	1.00	—	—	0.40	
-4	1.02	1.00	*	2.02	1.00	1.00	—	—	0.18	
-3	1.02	1.00	—	2.17	1.00	1.00	—	—	0.15	
-2	1.02	1.00	*	2.44	1.00	1.00	—	—	0.29	
-1	1.02	1.00	**	2.41	1.00	1.00	—	—	0.38	
0	1.05	1.02	**	2.45	0.99	0.99	—	—	0.80	
1	1.05	1.02	*	2.32	0.99	0.99	—	—	0.15	
2	1.05	1.02	*	2.52	0.99	0.98	—	—	0.12	
3	1.05	1.02	—	2.13	0.98	0.98	—	—	0.82	
4	1.05	1.02	—	2.23	0.98	0.98	—	—	0.19	
5	1.05	1.02	—	2.10	0.98	0.98	—	—	0.20	

Note 1: the t statistics are calculated on the assumption of equal variance in the two populations.

Note 2: * indicates that the Mann-Whitney U test is significant at 5%. ** indicates that the Mann-Whitney U test is significant at 2%.

holding the CCA signal constant and examining the incremental effect of HCA. When the CCA signal is held positive, there is a 7% gain when the historical cost error is positive rather than negative. This contrasts with a 4% differential when CCA is held negative. Clearly, the historical cost forecast error is the dominant variable.

Statistical Diagnostics

Tables 5 and 6 report ' t ' tests based on the assumption of equality of variances. In most cases, the F test of this assumption revealed that it was warranted; in those cases where the test rejected the assumption, the t statistic was re-estimated assuming unequal variances and none of the significances between the groups in Tables 4 and 5 was affected. A further consideration is that the t test requires either the normality of both distributions or the operation of the central limit theorem. If there are circumstances in which these cannot be relied upon, the Mann-Whitney U test provides a powerful alternative (Siegel, 1956, p. 126). This test

was applied to assess the differences between the CCA groups; the results are also given. Of course, since the API measures cumulative excess returns, the significance tests on one particular day are not independent of tests on previous days.

When it is difficult to be sure about the properties of the sampling distribution *a priori*, the sample itself may be examined for such evidence. This bootstrapping method is explained in Marais (1984). The technique was used to examine the difference between the first two portfolios in Table 6 (with 138 and 62 cases respectively) on announcement day (day 0); the excess returns between the two portfolios are still different at the 5% significance level.

Incremental information content in the longer run

Rationale

The tests conducted so far have been concerned with information content leading up to announce-

ment day. A more important issue (from the point of view of accounting policy decisions) is whether or not CCA earnings is the concept of permanent income which drives security prices over a longer period. Beaver, Griffin and Landsman (1982) (BGL) address this question by regressing annual share returns on annual proportionate changes in historical cost and replacement cost earnings. Their findings are that ASR 190 replacement cost earnings provide no additional explanatory power once historical cost earnings are included. In this section we replicate and extend the BGL study. Our research method differs slightly from BGL's and is designed to improve the power of the tests. The differences are as follows:

1. BGL used a two-stage procedure to identify the impact of replacement cost earnings. However, Christie, Kennelley, King and Schaefer (1984) point out that the method is no more effective than ordinary multiple regression in identifying the incremental impact of each variable. Consequently, the latter method is used here.

2. BGL examine returns over the holding period 31 December through 31 December and the companies in the sample were chosen to have a 31 December year end. Two problems stem from this design: (i) since the financial statements are not publicly available at the accounting year end, the measured returns might not have impounded all the information and, more seriously, (ii) since the holding interval is identical across all companies in the sample the effects of other information will not have been taken into account. BGL attempted to measure the sensitivity of the results to (i) by replicating on a 31 May through 31 May basis but no allowance was made for (ii). The approach in this section of our paper is (i) to measure the proportionate changes between actual announcement days; and (ii) to select companies regardless of their accounting year and to include a market variable, thereby allowing some kind of randomisation and specific control for the extraneous information effect.

3. BGL examine annual share returns. In the present paper a two-year period is used to increase the chance of observing historical cost and current cost values moving in different ways.

Definition of Variables

R_j = the return on share j , measured between the announcement days of 1980 earnings and 1982 earnings (11)

R_{jm} = the return on the FT Actuaries All Share Index measured between the announcement days of 1980 earnings and 1982 earnings for company j (12)

H_j = the proportionate change in the HC earnings per share (Datastream 183) for company j , between the accounting

period ending 1980 and the accounting period ending 1982. The 1980 earnings per share values are all positive

C_j = the proportionate change in CCA net earnings per share (Datastream 251) for company j , between the accounting period ending 1980 and the accounting period ending 1982. The 1980 earnings per share values are all positive (14)

HCA_j = the annual proportionate change in HC earnings per share (Datastream 183) for company j (15)

CCA_{j_0} = the proportionate change in CCA earnings per share (Datastream 251) as in equation (4)

The Model

$$R_j = a + b \cdot R_{jm} + c \cdot H_j + d \cdot C_j + U_j \quad (16)$$

where U_j is the error term and j indicates the observation.

The Results

Table 7 gives the results of regressing R_j on R_{jm} , H_j and C_j . Panel A of the table gives the parameter estimates and related 't' statistics. The proportionate change in HC earnings per share is the only significant influence on long-run share movements. The CCA variable is not significant. In addition the market variable is not significant; this presumably is a consequence of the long holding period used in this test. This evidence supports the BGL study which indicated that long-run stock prices are generated by historical cost signals.

Table 7
Regression of share return over two reporting periods, for reporting years 1980-83

Panel A: Estimates of

$$R_j = a + b \cdot R_{jm} + c \cdot H_j + d \cdot C_j + U_j$$

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	No. of cases	<i>R</i> ²
0.18 (0.75)	0.09 (0.12)	1.02* (10.22)	0.001 (0.22)	90	0.55

Panel B: Rank Correlation of absolute U with

	R_{jm}	H_j	C_j
	0.02	0.11	0.03

Panel C: Correlation Matrix (zero-order) of
 R_j , R_{jm} , H_j & C_j

R_j	1.0		
R_{jm}	-0.01	1.0	
H_j	0.74*	-0.02	1.0
C_j	0.06	0.02	0.06
	R_j	R_{jm}	H_j
			C_j

Note: * statistically significant at 5%.
Figures in parenthesis denote *t* statistics

Replacement cost earnings do not have an incremental effect on returns, given knowledge of historical cost earnings.

Statistical Diagnostics

Panel B of Table 7 reports the rank correlation tests for cross-section correlation in the error term; there is no sign of this problem. Panel C reports the zero-order correlations between the variables to test for multicollinearity. Apart from the strong correlation between share returns and historical cost information, there is no evidence of any inter-correlations between variables which may interfere with the estimation process. This result contrasts with the BGL results in which there was significant multicollinearity between the H_j and C_j variables; consequently, the evidence presented here is perhaps even stronger than that in the BGL paper.

At first sight the low correlations reported in Panel C may seem counter-intuitive and inconsistent with previous studies. Specifically, the low correlations between R_j and R_m , and H_j and C_j need further elaboration. It is important to note that the customary systematic relationships relate to periods of less than two years (the holding period employed in this test); security pricing models typically employ daily, weekly or monthly returns, and replacement cost/CCA studies tend to concentrate on the annual announcement to shareholders. Such relationships may not survive the transformation to a longer holding interval. Indeed, a major factor in the choice of the two-year period was to try to reduce these problems of multicollinearity.

For comparison with prior studies the long-run tests were replicated employing a one-year holding period and the results are given in Table 8. The CCA variable still does not increase the explanatory power of the equation. Furthermore the parameter estimates in Panel A and the zero-order correlation matrix to Panel C are now very similar to those of BGL (1982, Tables 3 & 4).

Limitations

Finally, some reservations are in order:

1. The paper does not investigate the extent to which the results are driven by outliers. One approach to this, adopted in Bublitz, Frecka and McKeown (1985) and Beaver and Landsman (1983), is to truncate the offending variables. This paper attempts to deal with the issue by varying the deflators used in the regression models and also by employing the Abnormal Performance Index methodology which uses a coarser partitioning scheme and thereby reduces the weighting of extreme observations.

2. Along with all the other studies in the area, the paper does not give serious consideration to the

Table 8
Regression of share return over one reporting period
for reporting years 1980-83

Panel A: Estimates of

$$R_j = a + b \cdot R_{jm} + c \cdot HCA_j + d \cdot CCA_j + U_j$$

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	No. of cases	<i>R</i> ²
-0.01	0.84*	0.44*	0.014	176	0.32
(-0.53)	(6.05)	(5.86)	(0.71)		

Panel B: Rank Correlation of absolute *U* with

<i>R</i> _{jm}	<i>HCA</i> _j	<i>CCA</i> _j
0.07	0.12	0.07

Panel C: Correlation Matrix (zero-order) of R_j , R_{jm} , HCA_j & CCA_j

R_j	1.0		
R_{jm}	0.38*	1.0	
HCA_j	0.41*	0.00	1.0
CCA_j	0.19*	0.00	0.37*
R_j	R_{jm}	HCA_j	CCA_j

Note: *statistically significant at 5%.

Figures in parenthesis denote *t* statistics.

issue of model building with the consequent loss of statistical power arising from model misspecification. Whilst some studies justify the use of accounting earnings in a model of share returns (Jennings, 1986; Christie, 1986; Easton, 1985; Beaver, Lambert and Morse, 1980), they ignore the form of the model; i.e. no theoretical justification for an additive specification involving deflated changes in two measures of accounting earnings (HCA and CCA) is given. For example, when CCA profits are added to a regression equation containing HCA profits, the regression methodology will attribute to CCA its unique contribution to the explanation of the variation in security prices; but how, for example, is this different from simply adding the CCA adjustments to the equation? This clearly is an important area for future research.

3. There are reasons to suppose that the responsiveness of share prices to CCA disclosures will vary between industries and between years. We investigated the latter possibility by incorporating dummy variables on the constant and the HCA and CCA variables (HCE_{jo} and CCR_{jo} respectively), in order to model any shifts in the coefficients between years. Since none of the coefficients for HCE was significant, a result which is inconsistent with most prior research, little reliance should be placed on the CCA coefficients; the results are available upon request. The possibility of an industry effect awaits further research.

4. In the present study we have assumed that the best nil-cost forecast of CCA profit is given by the previous year's figure. An updated nil-cost forecast

is often available in the form of the interim published CCA figure. Whether or not the interim provides a better estimate, given that it may be clouded by seasonal factors and arbitrary allocations, is moot. This possibility also awaits further research.

A further source of easily available information is the HCA and CCA disclosures of other firms in the same industry. This possibility was investigated, but the impact of better than expected HCA results by another firm was a significant fall in the share price! Since this result is counter-intuitive, the results are not reported but are available upon request.

5. The paper focusses on whether or not there are any wealth effects of SSAP16 information. The question of whether benefits exceed the cost of preparation has not been addressed.

6. The evidence presented here suggests that the market behaves as if CCA disclosures are used by investors in their portfolio decisions. Such an effect would also be observed if CCA numbers were correlated with other disclosures on announcement day, such as might be contained in the chairman's statement or dividend declarations. This possibility is not investigated here.

Conclusions

This study has investigated the hypothesis that current cost signals are impounded into share prices. The results suggest that CCA information has a small but significant impact on stock returns in the days up to announcement. However, CCA does not seem to be the driving force behind long-period returns. Returns in the long run are associated more closely with historical cost information than with that generated by SSAP16.

One of the features of the approach has been to specify current cost as a supplementary signal to historical cost. Consequently, it is hypothesised that investors are likely to take a rough and ready approach to the interpretation of all the detailed corrections involved in the CCA measurement system. For the most part in this paper, the impact of CCA has been tracked using annual proportionate changes in CCA earnings per share.

The rationale for treating current cost as supplementary is the experimental nature of SSAP16. Investors are concerned mostly with capital gains which derive from anticipating changes in expectations of other investors. Since CCA is a new measurement system, it is difficult to see what kind of 'conjectural equilibrium' could lead investors to expect share prices to be driven by the new aggregation procedures for measuring corporate performance. Consequently, the results here which indicate that historical cost earnings are the basis of long run stock returns are not surprising.

Although the current cost measurement system cannot be expected to replace traditional historical cost measurements without substantial intervention, current cost may still have a recognisable part to play in investor evaluation. To the extent that current cost information will eventually show itself in HCA measurements (for example, if dividends exceed current cost income), investors will have an incentive to base their portfolio decisions in part on current cost. In this framework, current cost is one of the many adjustments which investors may make to historical cost measurements (along with the chairman's statement, the directors' and auditors' reports and the funds statement, for example) to form an expectation about future periods' historical cost incomes. This marginal impact of CCA is reported in the regression and abnormal performance index experiments employing daily returns around the day of announcement. We suggest that this result is due to the fact that the market is primarily concerned with historical cost. Further support for this position is given by our finding that the current cost variable is not significant in our long-run experiments, whereas the historical cost one is.

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Table of Contents
Volume 9, Number 3
September 1987

Editorial Data

Andrew A. Christie

On Cross-Sectional Analysis in Accounting Research

Greg Whittred

The Derived Demand for Consolidated Financial Reporting

Wilbur Lewellen, Claudio Loderer, Kenneth Martin

Executive Compensation and Executive Incentive Problems: An Empirical Analysis

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Revaluation of Fixed Assets in Accruals Accounting

John R Grinyer*

Abstract—The paper explores the topic of revaluation in accruals accounting under the assumption that an important purpose of financial statements is to report on management's financial performance. Having differentiated valuation and matching based approaches, the paper proceeds to indicate some reasons for revaluation in the latter by reference to the literature of management accounting and logical argument. It identifies exit value (net realisable value) as the most appropriate basis for valuation for the postulated purpose, but argues that revaluation should not occur annually but by reference to the expiration of 'planning periods' or to other specified events which may occur earlier. Therefore its arguments and proposals differ from those previously associated with advocates of exit value. The article concludes by discussing some of the practical issues arising from its suggestions.

Introduction

Although revaluation of fixed assets in historical cost accounts (HCA) has long been practised in the UK, is permitted by the Companies Act 1985 (4 Schedule 31(2)) and is supported by the Accounting Standards Committee (ASC) (see ED 37, preface para 1.15), it is forbidden in the USA and in many other countries (see Gray, Campbell and Shaw, 1984, pp 88–90). Such differences could result from conflicting perceptions of the purpose of revaluation in accruals accounting, which in turn would imply a lack of agreement concerning the reasons for and the appropriate basis of such revaluations. This paper addresses these problems by presenting arguments and proposals for the systematic revaluation of fixed assets in 'matching' based accounting by reference to exit values (net realisable values). It is concerned exclusively with business organisations in capitalist economies.

There is a pressing need for the establishment of an accepted rationale for revaluation, because it is widely practised in the UK. (The ICAEW surveys of published accounts for the years 1974–75 through 1982–83 show that a majority of the firms surveyed revalue 'property' and that a significant number revalue 'other fixed assets'.) A variety of bases have been used for revaluation in the past, although most companies have followed the advice of Statement S20 (issued by the ICAEW in 1974) that only existing use valuations or depreciated replacement costs are suitable for inclusion in accounts. The Companies Act 1985 (4 Schedule 31(2)) officially authorises revaluations on the

basis of either 'market value' or 'current cost', which allows companies a wide range of choice and could result in significant variations in accounting treatment. A further problem arises because of the considerable variations to be observed in the periods that elapse between revaluations, both between companies and even within the same company. (An example of the latter is Marks & Spencer, which revalued property in 1955, 1964, 1975 and 1982.) Although unregulated variations in the timing of revaluations may often be justified, they do provide management with additional opportunities to manipulate the information shown in the accounts. The wide range of choice of revaluation practices in financial reporting in the UK has led some commentators to make quite sweeping condemnations of the practices which have been adopted for accounting for fixed assets (see e.g. Griffiths, 1986, chapter 9) and there appears to be a need to establish a conceptual basis that will enable the reasoned development of revaluation in accruals accounting.

This paper addresses the above issues by presenting a partial theory¹ for the revaluation of tangible fixed assets in accruals accounting. Valuation based accounting models will be discussed briefly to differentiate them from conventional accruals accounting, which is based on the matching of costs to revenues or periods as appropriate (see e.g. Skinner, 1979, p. 373), but the essential purpose of the paper is to consider revaluation in matching based accounting approaches.

*The author acknowledges the financial assistance received from the Carnegie Trust for the Universities of Scotland in the development of this paper. He also wishes to thank anonymous referees for constructive comments.

¹The integration of the thinking of this paper with that of Grinyer (1985 and 1987) provides a more complete theory, but it also involves a more fundamental departure from current practice and will not be discussed here.

Potential theoretical bases

Most authorities would accept that a theory of accounting should specify the purposes for which a financial statement is prepared. This matter has been discussed in the literature of accounting. In the UK the ASSC's discussion document on the Corporate Report (1975) provided a wide range review of the relevant issues. It identified investors as one group with an interest in financial statements, and the provision of information to help them to predict the future cash flows arising from investment in a firm has been proposed as a fundamental purpose of such statements (see e.g. Carsberg, Arnold and Hope, 1977; and FASB, 1976). A different purpose has been identified by the burgeoning literature on agency theory² in the last decade, which re-emphasises the role of financial reporting as a means of monitoring and controlling the performance of managers and thus the earlier accountancy concept of 'stewardship'.

It is possible that different purposes are best served by different sets of accounting information so that the choice of an objective of financial reporting on which to base an analysis may be crucial to the development of the set of arguments presented. The discussion below proceeds under the fundamental assumptions:

1. that one important purpose of financial statements is periodically to report on, and thus to assist the monitoring and motivation of, management's financial performance³ (see Ijiri, 1975, pp. 29-35); and
2. that such performance is to be assessed by reference to increments in the value of the firm's net cash flows (wealth), associated with the operations of the accounting period and resulting from management's activities, because the owners of capital want 'wealth' to be maximised.⁴

Acceptance of the above assumptions leads to the need to define a basis for measuring the

²See Ross (1973), Jensen and Meckling (1976), Shavell (1979), Holmstrom (1979) and Fama (1980) for well known papers in the area of financial management. Watts and Zimmerman (1979) is a paper in the area of accounting that makes reference to the relevance of agency theory (AT) to financial reporting. Surveys that relate the concepts of AT to management accounting are to be found in Baiman (1982) and Scapens (1985) chapter 11.

³It follows that the concepts which are implicit in responsibility accounting and in other aspects of accounting for management motivation and control (see Emmanuel and Otley, 1985, for a comprehensive review) underlie the thinking of this paper.

⁴This assumption is consistent with the primary objective of maximising shareholders' wealth, which is assumed by most textbooks on financial management (see e.g. Van Horne, 1983, p. 6) and much of the literature of accountancy (see e.g. Barton, 1974, p. 671), and with the perceptions which underlie agency theory. It is also compatible with the notion of maximisation of monetary surplus (see Grinyer, 1986).

accretion of wealth (profit) that is appropriate for the designated purpose. Two fundamentally different approaches to the measurement of profit are to be found in the accountancy literature. The first could be called the 'valuation' approach, because it attempts to value the firm at each of two points in time and defines profit as the increase in value during the intervening period, after adjusting for monetary transfers to or from investors. Its theoretical basis is most completely defined for variants of Economic Income⁵ but, because it is based exclusively on the valuation of subjectively derived estimates of future cash flows, that approach is usually thought to be unsuitable for direct application in accounting reports of past performance (e.g. see Barton, 1974; Shwayder, 1969). In addition, all accounting approaches that are based on comparing aggregates of current market values of net assets at the start and end of the accounting period to determine profit can be classified as valuation based approaches, for the aggregates can be regarded as surrogates for the worth of the business at those times. Obviously the revaluation of assets at the end of each accounting period is an integral part of the valuation approaches and the bases for determining value are clearly defined by the concept adopted (e.g. each of replacement cost, deprival value and net realisable value has been advocated by different authors). Thus the requirement for, the general basis of, and the timing of revaluation are identified for such approaches.

Despite the apparent dominance of valuation based concepts in the academic literature, most of accounting practice seems to be based on the second approach of matching costs and revenues (see ASC, 1971; Barton, 1977 pp. 74-79; and Edwards, Bell and Johnson, 1979, pp. 11-14). This approach involves a type of input/output analysis, for it usually records the value of sales transactions and deducts related direct costs and period costs to find the wealth created by the series of transactions that is associated with the accounting period (see e.g. Skinner, 1979, p. 373). The need for revaluation in matching based approaches is not self evident, because they do not attempt to measure the values of businesses at any point in time. It is therefore important to recognise that the valuation and matching approaches are fundamentally different, for it is possible to become confused by irreconcilable arguments derived from the different conceptions.

Many scholars believe that valuation based approaches offer the best chance of progress in the development and refinement of financial reporting. This paper deliberately avoids that issue, which requires a separate paper (see e.g. Grinyer and

⁵E.g. see Hicks (1946), Alexander (1948) and Solomons (1961).

Lyon, 1988), and is concerned exclusively with the issue of 'revaluation' of fixed assets in matching based financial statements. It does not imply that the use of 'valuation' based methods is inappropriate for many accounting purposes and has the more restricted objective of suggesting improvements in matching based approaches based on analysis under the assumptions identified above. Thus valuation concepts such as deprival value, which attempt to establish the value to the firm of fixed assets, will not be discussed here. This is because they relate to the valuation based approaches that seek to measure changes in total wealth between the commencement and end of the accounting period, and not to the matching based approach as defined above.

Historical cost accounting (HCA) and current purchasing power accounting (CPP) are the best known matching approaches. Both require that original cost inputs be identified and matched with net revenues in order to calculate the figure of total net profit. They therefore face problems associated with the allocation of the costs of fixed assets to accounting periods (see Thomas, 1969, 1974, 1977 and 1979). Since this analysis is concerned with matching based accruals accounting, it proceeds on the assumption that the allocation problem has been solved⁶ so that apportionments can be made on a theoretically sound basis and are therefore subject only to errors of judgement and of estimation. HCA and CPP could also be considered to be deficient because they ignore the time value of money⁷ on equity finance, so that they cannot be related directly to a model based on economic values whenever interest rates are material. Consequently the subsequent analysis proceeds from an intermediate position in the chain of reasoning because it does not relate revaluation directly to concepts of economic value. Despite the identified problems, 'matching' is used in practice and is therefore apparently perceived to be both feasible and useful so that improvements in existing practices should be worthwhile, even if their theoretical basis is not completely developed.

The following analysis is based on the above rationale and therefore proceeds to explore the issue of revaluation in conventional accruals accounting. That is possible under the subsidiary assumptions:

- (i) that theoretically correct matching of the costs of fixed assets to accounting periods is possible, in a way which enables the identification of the net wealth created by the activities associated with those periods and

which is relevant for the assessment of managers' financial performance; and

- (ii) that interest on outlays can be safely ignored.

To ease the task of exposition, it is also assumed:

- (iii) that the value of money remains constant, i.e. that there is neither general price level inflation nor deflation; and
- (iv) that figures of revenue adequately represent the gross cash inflows arising from operations during the period.

Measurement of performance

Given the above assumptions, financial statements need to report on managers' financial performance by reference to the increment in the wealth in the firm that has occurred as a result of their activities. Furthermore, subsidiary assumptions (i) to (iii) indicate that *this* paper adopts cash figures, unadjusted for interest or inflation, as appropriate measures of wealth and the matching process as an adequate basis for identifying wealth increments by reference to relevant activities. As subsidiary assumption (iv) specifically assumes that cash values of sales are realistic reflections of the gross cash inflows from operations, only the relevant cash outlays on the inputs remain to be determined.

Because the assumed objective of financial statements is to report management's financial performance, the concepts of 'responsibility accounting' can be considered to be applicable so that current management should be subject to reports that 'emphasise the factors controllable by them' (Morse, 1981, p. 436). Such thinking leads to the perception that the basis on which the cost of a resource that has been consumed should be calculated should be the amount of cash that the existing management team committed to that resource. Conventional HCA matching approaches assume that the correct basis for identifying the cost of an input is the outlay that occurred when the resource involved was first purchased. It can reasonably be assumed that in most cases the variable costs (of manufacturing or of the provision of services supplied or of goods acquired for resale) that are determined in that way are likely to have been incurred at a time when the current management team was responsible for the firm's affairs. The same could usually be said of period-related overhead costs that are contracted on a short term rather than a long term basis. Under conventional practices these inputs are probably shown at values that correctly reflect the investment of *cash* that the present management made to acquire them and which therefore provide an appropriate basis for the evaluation of that management's performance.

⁶A possible solution is presented by Grinyer (1987).

⁷A primary characteristic of the Earned Economic Income approach advocated by Grinyer (1985 and 1987) is that it does take account of the time value of money.

A different situation exists in the case of outlays on many long-lived fixed assets and of contracts for services on a long term basis. Such outlays were often committed by managers who have since left the business and whose sound or unsound decisions should not be attributed in the accounts to the present management team if the financial statements are to monitor current management's financial performance. (Managers should only be held responsible for actions that they could have controlled: see e.g. Morse, 1981, p. 434; and Matz and Usry, 1984, p. 208). Furthermore, managers usually have the opportunity to disinvest and, under the assumption that they are expected to generate wealth, should therefore periodically examine the desirability of retaining rather than selling currently owned assets. A decision to retain existing assets is effectively the investment of the prospective cash proceeds that would have arisen if they had been sold.⁸ It follows that the controllable cost of investments in fixed assets is their sale price at the time of the last decision to retain the assets. This perception was emphasised by Chambers (e.g. 1966, 1967 and 1982) and his proposed system of Continuously Contemporary Accounting is consistent with a cash based matching method that assumes reinvestment decisions at the commencement of each year. His proposals accord with recommendations made by MacNeal (1939) and Sterling (1970, 1981) and may properly be viewed as suggesting a valuation based model. Nevertheless they draw on perceptions similar to the ones presented above.

Despite its initial appeal, annual revaluation in 'matching' based accounts is likely to be inappropriate for assessing financial performance because most investment decisions involving fixed assets are made with a much longer time horizon than one year (see e.g. Weston, 1971 and Solomons, 1971). In that event annual revaluation can distort the measurement of financial performance so far as investment in highly specialised long term resources with low resale values is concerned (see

Solomons, 1971), for such assets are usually acquired with the expectation that their original cost will be justified by the services that they will provide over a number of years constituting the firm's 'planning period' and should therefore be assessed on that basis. Thus the revision of the figures of cost inputs to reflect the resale value of fixed assets should occur, if at all, at time intervals that are long enough to avoid misrepresentation of the results of investment in specialised assets.

The firm can be perceived as conducting its planning by reference to a time horizon that is appropriate to the environment in which it operates and to the type of activity in which it is engaged. One might reasonably hypothesise that complex economic, technological and behavioural factors typically influence the choice of a planning horizon, so that it is difficult to select appropriate dates. Nevertheless it seems to be widely accepted that such horizons are both desirable in principle and used in practice for the evaluation of prospective major projects.⁹ This paper therefore assumes that firms adopt standard time intervals to determine their planning horizons for each class of asset and defines such intervals as 'planning periods'. On the basis of the arguments outlined above, managements that have acquired specialised fixed assets should be permitted to justify their investment decisions by reference to the whole 'planning period' that was relevant to the class of asset involved, for the anticipated flows of the entire period were presumably considered in management's evaluation of a capital project. If the above argument is accepted, planning periods establish the minimum time intervals, for accounting for the investment, that should be imposed on management in the absence of changes in the management team.

On the other hand, given fundamental assumption 2, management should be expected to strive to maximise wealth so that it should regularly review the advisability of selling the fixed assets which it controls to ascertain whether that would increase wealth. Such reviews should have taken place within the planning period, so that such periods could be claimed to be the maximum intervals of time that should elapse before the disposal of fixed assets should be considered with the consequent reinvestment of forgone sale proceeds. In that event planning periods represent suitable bases for selecting the timing of the recognition of reinvestment, and thus of revaluation, in accounting; in effect they identify the earliest reinvestment decision which can be recognised while satisfying

⁸An anonymous referee has suggested that: 'In a going concern, the retention of existing assets is more realistically seen as a decision not to replace them at that time. Their going concern value is therefore their current cost'. Such a perception is not disputed so far as the establishment of 'value' is concerned, but it is irrelevant to the determination of the outlay for which management should be held accountable. That sum has to be established by reference to the cash consequences of the decisions available to it, which are as follows: Retain—with no immediate cash movements and subsequent inflows; Sell—with an immediate inflow of the sale proceeds but no subsequent inflows. Thus the decision to retain involves an immediate loss of the sale proceeds followed by subsequent cash inflows. The investment made by management is the forgone sale proceeds and *not* the 'current' costs of the assets involved because they do not represent a possible cash flow associated with the decision to retain an asset.

⁹See Ansoff (1968, p. 48), Amey (1969, p. 13–14), Amey and Egginton (1973, pp. 146–149 and 166–168), Briston and Liveridge (1979, pp. 45–46), Hunt *et al* (1961, p. 617), Solomon and Pringle (1980, pp. 360–361), Sugden and Williams (1978, pp. 63–65).

the 'minimum period' accounting constraint identified above with planning horizons. The above thinking suggests that intra-period revaluation would not be desirable in the absence of either changes in management or the explicit recognition by management that the original investment has failed, so that planning periods can be used to establish the accounting lives of investments, and any accounting statements issued before the end of the relevant period are in effect interim reports of progress towards the outcome for the period as a whole.

One could argue that interdependent fixed assets that would be acquired or disposed of as a set should be revalued at the same time, for the reinvestment decision is necessarily made at one time. Fixed assets acquired to maintain or to add to an existing 'interdependent' set could then be regarded as an integral part of the set and thus be revalued with the set as a whole at the end of its planning period. As each set would then include all mutually dependent assets, it could be considered to be independent of other sets.¹⁰ It follows that for the considered purposes each fixed asset could be treated as an element of an independent set of resources (i.e. one that is not dependent on other sets of fixed assets). Clearly a major business might have many of such sets of fixed assets, in which event each could have a separate planning period and consequently a separate date of revaluation.

As the above arguments are fundamental to the revaluation proposal presented in this paper, it may be helpful if they are now summarised as follows. It is widely accepted within the literature of management accounting that management performance should be appraised by reference to costs and benefits which are controllable (i) by the individual or group being assessed, and (ii) within a time period that is relevant for the analysis (see Horngren, 1972, p. 163). Adoption of that perception leads to the conclusion that the historical costs of fixed assets that were acquired by earlier management teams, or by the existing team in earlier planning periods under a different business environment, are irrelevant for assessing the financial performance of the current management team. The cash investments in fixed assets that it has made include the sales proceeds that were forgone when it decided to retain rather than to dispose of fixed assets acquired by earlier teams or in previous

planning periods. Such thinking is consistent with the 'exit value' school of accounting theorists, but not necessarily with its attempts to revalue assets annually, because the choice of such a short period seems to be inconsistent with the time interval over which the acquisition of many assets has to be justified in practice. (For example, annual revaluation seems to be inappropriate when fixed assets are traded in markets in which there is a very substantial difference between the prices of purchase and sale.) It appears that the adoption of planning periods would provide a reasonable basis on which to establish the timing of revaluation of interdependent sets of fixed assets.

The top management team typically comprises a group which exercises control under the immediate influence of the chief executive officer (CEO). It is therefore possible that a change of CEO will have such a profound effect on the thinking of the board of directors that the latter may be viewed as effectively a new team. In addition, given fundamental assumption 2, it should be expected of the incoming CEO that he or she will review the firm's activities to determine whether its portfolio of assets is likely to produce a satisfactory financial performance. In these circumstances, one can reason that an appropriate time for revaluing fixed assets as a basis for modified cost inputs is when there is a change in the CEO of a firm. (As the new team takes responsibility for a set of assets which could be sold in order to generate cash, the net sale value that has been lost by reason of retention represents the investment decision which it made and which therefore should be used to assess its performance, whether that value exceeds or is less¹¹ than the book figures of the unallocated original cost.) There is therefore a case for revaluing assets at their net realisable value at the time of major changes in management, which effectively terminates existing planning periods and starts new ones.

A further situation that could signal the effective cessation of one planning period and the commencement of another is when management has consciously considered terminating an activity in order to change the firm's portfolio of in-

¹⁰There is clearly a problem of scale in this matter. Thus several interdependent sets of machines may operate in the same factory and be dependent on it, although the factory would not necessarily be sold if one or all of the sets were sold. Given that factory space can be rented, ownership of property can be seen as an investment to save paying rents and thus not an essential member of the interdependent set of assets. It seems likely that the best available criterion for establishing the members of a set is whether they would necessarily be disposed of together if the activity which they support was discontinued.

¹¹This may give rise to the situation in which current management shows a relatively high profit figure consequent on worthwhile investment, in assets with low resale values, by the managers who preceded them. Such a situation introduces the possibility of the existence of unsatisfactory financial performance, because management has not taken full advantage of its opportunities, without that fact being shown specifically in the accounts. However, management's performance will probably be identifiable from trends in sales and other variables. Logic clearly suggests that the investment decision attributable to new managers arises when they decide to retain assets; the difficulty is in identifying the figure of the sale value that has been forgone, which could frequently be the worth of the total firm sold as a going concern. This matter is discussed below.

P, 6005

vestments,¹² but has decided to retain it with its associated asset base. That decision should be assessed by reference to sale proceeds forgone and not to original costs, which suggests that the reappraisal could justify revaluation in the accounts and the start of a new planning period.

The conclusions of this section of the paper can be summarised as follows:

- (a) Following the logic of 'responsibility accounting', managers' current financial performance should not be assessed by reference to the decisions of their predecessors nor to those of their own decisions which were made in earlier 'planning periods'.
- (b) The opportunity to sell assets, or indeed the whole business, means that managers should periodically consider that option and should subsequently be assessed by reference to the potential sale proceeds that were effectively reinvested in the business by their decision to retain the assets.
- (c) Following from (b), the valuation should reflect the net proceeds that would have arisen from the sale of the business unit on the most advantageous basis available at the date selected for revaluation.
- (d) Revaluation on the basis identified in (b) and (c) should occur:
 - (i) on a change of chief executive, or
 - (ii) with continuing management, at the end of designated planning periods or when serious consideration was given by management to disinvestment in the segment of the business.

As the above discussion identifies the reason for revaluation, the basis on which valuation should be made and the means of selecting the timing of revaluation, it meets the identified requirements of a partial theory for revaluation in matching based reports. In such reports revaluation occurs in order to revise the figure of cash outlay that is used to calculate the cost of inputs, and not to establish the worth of the firm's assets, so that in *this* context notions of revaluation at replacement cost or at 'deprival value' are irrelevant because the figure sought is the amount of cash invested by current management. This does not, of course, imply that such valuation concepts are inappropriate in other contexts.

¹²An anonymous referee has suggested that a major change in prices, presumably authoritatively defined by reference to a percentage of the figure at which the asset is currently shown in the books of account, could also represent an occurrence which should result in a revaluation. That could be the case given significant changes in relative prices which might indicate worthwhile resale opportunities.

Control of the reporting process

The above arguments indicate that revaluation at net realisable value should occur at the end of planning periods, or at earlier times when the chief executive had changed or when management had undertaken a major examination of the disinvestment possibility and had decided to retain the assets. These latter events suggest a major re-examination of a large part of the business and should signal the commencement of a new planning period because they imply a conscious investment decision by management.

Some people, including the writer, would expect managers consciously to select revaluation dates that they perceived would present their performance in the way most advantageous to them. Such an expectation is consistent with the concept of 'information inductance' (see Prakash and Rapaport, 1977) and with a number of comments on practice (see Griffiths, 1986, chapter 9). It also reflects the thinking of the respondents to the ASC on ED 37 who warned against the practice of 'cherry picking' when revaluing, which is the practice of selective revaluation to enhance the reported performance. Those respondents mainly recommended that all of the assets be revalued at the same time. The logic of the planning period does not require such wholesale revaluation, but rather the separate revaluation of each segment of the firm's fixed assets that forms an independent set of interdependent resources. Thus revaluation could sometimes be conducted at different times for separate subsidiary companies or other distinct business units, whilst in the case of other businesses the total activities could be so interrelated that the revaluation of all assets should occur by reference to the same date. Interdependent fixed assets that would fetch the highest sale price when sold *in situ* should logically be valued as a group¹³ and thereafter treated in the books as a single resource. To implement the above proposals, each asset acquired could be assigned to an existing interdependent set of assets, or if it is a major independent resource could itself represent a separate set. Each set of assets could then be valued as a whole at the end of its defined planning period, or at the earlier times identified above. Thus the planning periods would define the maximum interval between revaluations but more frequent revaluation would be possible.

¹³A problem arises here with a successful business because of the existence of 'goodwill' that may be associated with an integrated unit. Ideally one would seek the economic value that reflects total sale proceeds forgone, but that is not observable from market data. This problem is the one identified in Note 11 in different form. Perhaps the best that can be done is to value the physical assets recognising that the firm has unrecorded goodwill (so that an above average profit is required from firms which are successful) and to admit that the revaluation is incomplete for that reason.

Any tendency of management to use revaluation to manipulate reported figures of profit could be restricted by regulations because:

1. The ASC could stipulate the length of planning periods for particular types of activity and thus prescribe the maximum periods between revaluations, if that was considered to be desirable. It follows that constraints could be imposed on deferral of revaluations and could be monitored via the auditing process.
2. The proposals suggest revaluation on a change of chief executive officer, which is a clearly identifiable event and is thus not capable of manipulation.
3. Management could be required to justify, in the annual financial statements, any other revaluation within a planning period and such a justification could be subjected to audit. Nonetheless, if this third revaluation option created genuine concern it could be dropped on the grounds of pragmatism without detracting from the other proposals for the timing of revaluations.
4. The ASC could stipulate the net realisable value basis for revaluation, and non-compliance could result in an audit qualification. As sale value is a market value the proposals seem to meet the requirements of the UK company law (Companies Act 1985, 4 Sch 31(2)).

One can reasonably claim that objections to the proposals on the grounds that they provide management with opportunities to manipulate financial reports are unlikely to be more justified than are similar claims concerning existing practices, e.g. in the area of stock valuation. In effect the proposals provide for the specification of 'planning periods' that indicate the maximum periods between revaluations. More frequent revaluations than are specified by planning periods could reasonably be construed as resulting in tighter rather than looser monitoring of management's financial performance. If sale value is less than depreciated investment cost, management's recorded performance is adversely affected by revaluation, which is therefore likely to be avoided by management whenever possible. On the other hand, if sale value exceeds depreciated original cost, revaluation creates higher costs to be set off against future receipts and therefore a future criterion of satisfactory performance which is more difficult for managers to achieve.

The introduction of revaluation would inevitably introduce estimates, and thus additional subjectivity, into financial statements. Nevertheless, as indicated in the introduction, such considerations have not deterred either businesses, the ASC or legislators from approving revaluation in HCA in

the past. Indeed, the proposals of this paper seem to be an improvement on current practice because:

1. The principles by reference to which assets should be revalued have been clearly identified, can be stated in official pronouncements and can be used to guide practitioners, including auditors, in their judgements.
2. A clear specification of the basis for, and timing of, revaluation can therefore be provided by the ASC and supported by reasoning.

Conclusions

Arguments have been presented above to support revaluation of fixed assets in financial statements that are based on the matching approach and are designed to monitor management's financial performance. Subject to the deficiencies of the conventional assumptions which it adopts, the analysis identifies the reasons for revaluation, the basis of revaluation and the timing of revaluation—consequently it meets the needs identified by many of the practitioner respondents to the ASC on ED 37 'Accounting for Depreciation'.

As is almost inevitable when one attempts to address the practicalities of accounting, this paper comprises deductive analysis intermingled with perceptions induced from observations of practice and of the thinking which is widely accepted in the accounting literature. Furthermore, when the paper considers the problems of implementation it becomes relatively speculative, since it can only suggest possibilities which, in an uncharted field, are not yet supported by extensive empirical evidence and therefore are largely based on reasoned judgements. Such speculation is, however, a feature of most substantially new proposals in an applied area such as accounting, which involves people and their responses to a reporting system that monitors their performance.

There may be some unidentified practical difficulties associated with the revaluation approach suggested above, but that is probably true of all attempts to improve reports on the financial performance of managers of ongoing businesses in an uncertain environment. In the author's judgement, the advantages of revaluation on the identified basis outweigh the disadvantages. Others will judge for themselves.

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The Auditor, Third Parties and Contributory Negligence

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In recent years a number of important UK and Commonwealth legal cases have thrown fresh light on the extent to which third parties are entitled to rely upon audited financial statements when making commercial decisions, e.g. whether to invest in a company or to lend a company money. The trend in these cases has been to extend the auditor's extracontractual duty of care to include those parties whom it could be reasonably foreseen would have relied upon the audited accounts of the client company.

This article considers the circumstances in which the auditors 'ought to know' that the accounts are likely to be relied upon by third parties, and in particular the question of whether there is a duty of care to individual shareholders acquiring shares in the normal course of business. It will also discuss the relevance of the concept of contributory negligence; the extent to which the duties and responsibilities of the auditor overlap with those of the directors; and the extent to which auditors are able to disclaim their responsibilities by means of exclusion clauses and disclaimers.

The legal background

Until the well known decision in *Hedley Byrne v. Heller* the extent of an auditor's responsibilities to any party other than his actual client (and, in the case of a corporate client, the shareholders of that client) was, in the absence of deliberate deceit, minimal. This was clearly demonstrated in the case of *Candler v. Crane Christmas* in which the Court of Appeal held (with Lord Denning dissenting) that in the absence of a contractual or fiduciary relationship between the parties the defendants owed no duty to the plaintiff to exercise care either in the preparation of their client's accounts or in giving their audit report thereon. Therefore no action for negligence could be maintained notwithstanding the fact that the defendants knew that the accounts they were preparing were intended to be

shown to Candler as a potential investor in the company.

The door to a wider scope of liability was opened by the decision in the non-accounting case of *Hedley Byrne*. Here a bank, which provided a reference for a client knowing that that reference was intended to be shown to a third party, was held to owe a duty of care to that third party. In this case the House of Lords considered and effectively reversed the decision in *Candler v. Crane Christmas*. However, the *Hedley Byrne* decision limited responsibility to a narrow class of users, those with whom a special relationship exists, a relationship which casts a duty to exercise reasonable care in the making of a statement.

The *Hedley Byrne* decision was amplified by Lord Wilberforce in his judgement in *Anns v. Merton London Borough Council* (another non-accounting case). Lord Wilberforce considered that to decide whether a duty of care arises in a particular situation it is necessary to approach the question in two stages: first whether as and between the alleged wrongdoer and the person who has suffered damage there is a sufficient relationship of proximity or neighbourhood such that, in the reasonable contemplation of the former, carelessness on his part may be likely to cause damage to the latter in which case a *prima facie* duty of care arises; secondly if the first stage is satisfied it is necessary to consider whether there are any considerations which ought to negate, or to reduce or limit, the scope of the duty or the class of person to whom it is owed or the damages to which a breach of it may give rise.

Recent cases

In the last ten years, decided UK and Commonwealth cases specifically concerned with the question of auditor's liability to third parties have included, in chronological order, *Haig v. Bamford et al.* (1976), *Scott Group v. McFarlane* (1978), *JEB Fasteners v. Marks Bloom* (1981), *Andrew Oliver v. Douglas* (1982), *Twomax v. Dickson et al.* (1983), and *Lloyd Cheyham v. Littlejohn* (1985). As this paper contains frequent reference to the judge-

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ments in these cases a brief outline of each is provided to remind readers of the background to and context of the relevant judicial pronouncements.

Haig v. Bamford, Hagan, Wicken and Gibson (a Canadian case)

The defendants in this case were a firm of chartered accountants who, in the ordinary course of their business, prepared a financial statement for a client and signed a report thereon knowing that the statement would be used to persuade investors to put money into the client's business. The plaintiff invested money in the company on the faith of the financial statements which contained a serious error negligently overlooked by the defendants. The defendants were found to be liable notwithstanding certain scope limitations contained in the audit report. The Supreme Court of Canada held that it was sufficient that the accountants were aware, when they prepared the statement, that it was intended to be used by a limited class of potential investors. It was unnecessary to show that they had actual knowledge of the specific plaintiff who would use and rely on the statement.

Scott Group v. McFarlane (a New Zealand case)

The defendants were the auditors of John Duthie Holdings, a public company, which was taken over by Scott Group Ltd. The consolidated accounts of Duthie contained an elementary error resulting in the overstatement of assets. The plaintiffs subsequently discovered the error and brought an action claiming damages. The defendants, who were unaware of the interest of the plaintiffs at the time of the audit, admitted negligence but denied a duty of care or measurable damage. In the Supreme Court it was held that recoverable loss had occurred but that there was no duty of care: in the Court of Appeal (a higher court in New Zealand) it was held by a majority that a duty of care existed but that no measurable damage had occurred. (See Davison (1982) for a detailed analysis of this case.)

JEB Fasteners v. Marks Bloom & Co.

The plaintiffs took over BG Fasteners in June 1975. The takeover was not a success and the plaintiffs brought an action against the defendants, the auditors of BG Fasteners, alleging that the accounts of BG for the year ended 31.10.1974 were negligently prepared. Woolf J. found the defendants to have been negligent, and that they did owe a duty of care to JEB Fasteners although they were not aware of their interest at the time of the audit. However, he was of the opinion that JEB Fasteners did not rely upon the accounts as they would have taken over BG Fasteners even if the accounts had shown an accurate picture.

This case went to appeal on the question of

whether reliance on the accounts had caused the plaintiffs' loss. The Appeal Court judges whilst critical of certain aspects of the lower court judgement agreed that the actions of the plaintiffs had not been affected by the errors in the accounts and therefore dismissed the appeal.

Andrew Oliver v. Douglas

This Scottish case, heard before Lord Stewart in the Outer House, was brought to establish, subject to proof of fact, whether actions could be brought against the directors and accountant of Carden Homes Ltd. Carden sought an extension of credit from the pursuers (plaintiffs) on the strength of its profit and loss account for the year ending 31.8.1974 and its balance sheet at that date. These financial statements had not been formally approved by the directors of Carden and did not apparently contain an audit report. The pursuers averred that the financial statements did not show a true and fair view and that loss had been occasioned by reliance thereon.

Lord Stewart held that the pursuers had no case against the directors of Carden as they had discharged their responsibilities by employing both a competent book-keeper to keep the accounting records and a chartered accountant to prepare the financial statements. However, he held that it was at least open to answer that the accountant, Mr. Philip, did owe Andrew Oliver a duty of care as he should have appreciated that the financial statements would have been used for a variety of purposes in connection with the business of the company. Mr. Philip was given leave to bring a case against one of the directors on the grounds that he had participated in the preparation of the accounts.

Twomax v. Dickson, McFarlane and Robinson

Twomax purchased a controlling interest in Kin-tyre Knitwear in November 1973. According to the financial statements the company was trading profitably in the years to 31.3.1973 and 31.3.1974. However, a large loss was incurred in the year ending 31.3.1975. Receivership and subsequent liquidation followed and Twomax lost its entire investment. Actions were brought by Twomax and also by two minority shareholders, Gordon and Goode, alleging that they had made their purchases on the strength of inaccurate financial statements which had been negligently audited. Lord Stewart held that the defendants had been negligent in their audit of the accounts for the year ending in 1973 and that they did owe a duty of care to the plaintiffs who had relied upon those accounts although they were not aware of their interest at the time of the audit. One interesting aspect of the case was the willingness of the judge to accept that subsequent events showed that the accounts for the year ending in 1973 were materi-

ally inaccurate, although detailed investigation of those accounts was unable to establish where these inaccuracies lay.

The case went to appeal on the question of damages but as a settlement was reached during the course of the appeal little further light was shed on the judgement.

Lloyd Cheyham v. Littlejohn

Lloyd Cheyham invested substantial sums of money in Trec Rentals Ltd. subsequent to an agreement signed on 28 September 1981. A receiver was appointed on 11 December 1981 and in the eventual winding up Lloyd Cheyham failed to recover their investment. They brought an action against Littlejohn & Co., the auditors of Trec Rentals, alleging that their losses were consequent on their reliance on the audited accounts of Trec Rentals (which were delivered to them by the auditors on 28 September 1981, the day the audit report was signed) and that these accounts were misleading and negligently audited. Woolf J. held that a duty of care was owed by Littlejohn to Lloyd Cheyham but as the audit had not been conducted in a negligent fashion the plaintiffs were unable to recover any of their losses.

In deciding this recent case Woolf J. held that in order to succeed it was necessary for the plaintiffs to establish:

- (a) that the defendants owed them a duty of care. This involves establishing that the defendants ought to have realised that the accounts which they audited would be relied on in the circumstances in which they were allegedly relied on by the plaintiffs ('the duty of care issue');
- (b) that the defendants were negligent in the auditing of the accounts ('the negligence issue');
- (c) if the defendants were negligent did the plaintiffs suffer loss in consequence? ('the causation issue');
- (d) the amount of loss suffered by the plaintiffs ('the quantum issue').

Nature of the authorities

All four UK cases were decided at the first instance and are not therefore binding on other courts of the first instance. The *Andrew Oliver* and *Twomax* cases were decided in the Scottish Courts but it is unlikely that this is significant. Lord Stewart noted:

In this branch of the law decisions from England appear to have been accepted as applicable to our law.

Although the decisions are not binding they are of course influential, e.g. in the *Twomax* case Lord Stewart stated:

The approach of Woolf J. commends itself to me. If I may respectfully say so, it appears to combine the simplicity of the proximity or neighbour principle with a limitation which has regard to the warning against exposing accountants 'to a liability in an indeterminate amount for an indeterminate time to an indeterminate class'.

In the UK only the *JEB Fasteners* case saw a decided appeal to a higher court. This appeal was on the issue of causation and whilst Sir Sebag Shaw noted the conclusion of Woolf J. in respect to the duty of care he was careful to distinguish this issue from that on which the Appeal Court was asked to decide:

Woolf J. began his very careful judgment by considering the law as it had developed since *Hedley Byrne*. . . . After a compendious review of all the relevant authorities, he concluded that the defendants came within the ambit of potential liability to the plaintiffs for negligence in the certification of BG Fasteners' accounts. Having arrived at, and stated, that conclusion which opened the door to liability (and which was not in issue in the appeal, for no respondent's notice in that regard had been served), the judge went on to summarise the issues between the parties.

The Commonwealth cases were decided at a higher level but they are not binding on a court of first instance in the UK although again they are likely to be influential.

It is then not certain that higher UK courts would fully endorse the decisions in *Andrew Oliver*, *JEB Fasteners* and *Twomax* although it might be conjectured that they would be unlikely to reverse decisions which may be seen as part of a long-term trend in legal thought and action directed to a wider scope of responsibility for negligent actions.

What does reasonable foresight entail?

In what circumstances can auditors be expected to realise that the accounts they are auditing will be relied upon by third parties? There is little doubt that if the auditors know that the accounts are being prepared with a view to showing them to one particular potential user, and they know the existence of that user, then the auditors owe that third party a duty of care. Here the law has clearly moved on from the *Candler* decision, and in *Lloyd Cheyham v. Littlejohn* Woolf J. stated:

It is clear beyond peradventure in this case that the defendants knew that their audited accounts

were required by the plaintiffs in relation to their proposed agreement in respect of Trec. In these circumstances, subject to reserving his position if the case should go to appeal, Mr. Scott-Baker accepts that the defendants owed to the plaintiffs a duty of care in auditing the accounts of Trec. On my view of the law this is undoubtedly the position.

It would also seem to be established that a duty of care is owed when the auditors know that the accounts are likely to be used by one of a specific class of users but are not aware of the individual user. Here UK law has advanced beyond the decision in the famous US case *Ultramares v. Touche*. In this case there was evidence, accepted by the judge, that the defendants knew that in the usual course of business the balance sheet when certified would be exhibited by the Stern Company (the audit client) to banks, creditors, stockholders, purchasers or sellers, according to the needs of the occasion, as the basis of financial dealings. Indeed when the balance sheet was made up, the defendants supplied the Stern Company with 32 copies certified with serial numbers as counterpart originals. Nevertheless, despite the conduct of a 'grossly negligent' audit they were found not to owe a duty of care to a third party who did in fact rely upon the accounts; in the oft-quoted words of Judge Cardozo, to hold that such a duty of care existed might 'expose accountants to a liability in an indeterminate amount for an indeterminate time to an indeterminate class'.

However, the more recent cases outlined above clearly show a willingness of the judiciary to allow a duty of care to exist in circumstances where the auditors know the existence of a specific potential class of users but do not know the actual user. This was the situation in the Haig case; a decision which was commented on favourably by Richmond P. despite the fact that he was the only judge in the *Scott v. McFarlane* case not to accept that the auditors owed the plaintiffs a duty of care.

What then is the situation where the existence of a clearly identifiable set of potential users is not known to the auditors at the time of the audit as was the case in *Scott v. McFarlane*, *JEB Fasteners*, *Andrew Oliver*, and *Twomax*? (In the *Andrew Oliver* case there was evidence of knowledge of the potential user but it is not clear how much weight Lord Stewart placed on this evidence in coming to his decision.) In all four cases it was held that the auditors (in *Andrew Oliver* the accountant) ought to have known of the likelihood that the accounts would be relied upon by a third party.

The *Andrew Oliver* case is perhaps the one which corresponds most closely to the facts in the *Ultramares* and *Haig* cases. Here Lord Stewart stated:

The second third party [Mr. Philip] was not

in direct contact with the pursuers or their managing director... when the accounts were presented, but he must have appreciated that the accounts which he prepared might be used for a variety of purposes in connection with the business of the company.

In the *Twomax* case Kintyre Knitwear was a private company in which all the shareholders were directors. The auditors were aware that one of the shareholders wished to dispose of a substantial number of shares, indeed they placed an advertisement to that effect on behalf of the director. They were not however aware that another director wished to sell his interest in the company. Lord Stewart had no doubt that a duty of care existed:

I accept that at the time he audited the accounts to 31 March 1973 Mr McFarlane did not know of the possible interest of the pursuers Twomax and Mr Goode and could not have known because that interest did not arise until after these accounts were finalised. In particular I accept that he did not know of the projected sale of shares by Mr Surmann. Mr Gordon was involved as a potential investor before the audit certificate was signed but I cannot hold that Mr McFarlane knew about him. Mr McFarlane's state of knowledge when he audited the 1973 accounts included a number of matters which I consider relevant to an assessment of what he should reasonably have foreseen. He was aware that Kintyre was suffering from a shortage of capital. He was aware during the summer months of 1973 that a director, Mr Anderson, wished to dispose of his shareholding. He was aware that that shareholding was substantial, amounting to 10,000 shares. The defenders had in fact advertised in the newspaper under a box number on behalf of Mr Anderson. He knew for certain that the accounts were being made available to lenders in so far as he knew they were lodged with the company's bank. He knew that auditors' certificates, when they were 'clean' certificates, were commonly relied on by shareholders, potential investors and potential lenders. In the whole circumstances I consider that Mr McFarlane should have foreseen before he certified the 1973 accounts that these accounts might be relied on by a potential investor for the purpose of deciding whether or not to invest.

Again, the defendants in the *JEB Fasteners* case were not aware of the interest of the plaintiffs at the time of their audit (although they subsequently became aware of that interest) and discussed certain aspects of the stock valuation with them. However, from their association with the company since (and before) commencement of trading one year earlier the defendants were aware of the liquidity problems of the company and that

financial support was being sought in various forms. For Woolf J. this was sufficient to establish the existence of a duty of care:

As Mr Marks was aware of the financial difficulties of BG Fasteners Ltd and the fact that they were going to need financial support from outside of some sort, I am satisfied that Mr Marks, whom I can treat as being synonymous with the defendants, ought to have realised the accounts could be relied on up till the time that a further audit was carried out by the commercial concerns to whom BG Fasteners Ltd were bound to look for financial assistance.

Scott v. McFarlane saw acceptance of the most wide reaching definition of a duty of care. Although the plaintiffs' interest over a period of time was known to the directors of John Duthie (and indeed they exchanged copies of their annual accounts with the directors of Scott Group) it was accepted by the courts that the auditors were not aware of the plaintiffs' interest. One of the Court of Appeal judges, Richmond P., distinguished the facts from those of the *Haig* case on the grounds that the auditors did not have specific knowledge of the purpose to which the accounts were likely to be put. He noted that in the *Haig* case 'it was not necessary to decide whether it would have been sufficient if the accountants ought reasonably to have foreseen, in a general way, that the statement might be used for the purpose of attracting investors'. On the evidence Richmond P. held that there was too weak a signal in the accounts for the auditors to have been expected to anticipate a takeover:

In the present case the evidence failed to disclose circumstances which either made the auditors aware, or ought to have made them aware, that the 1970 accounts were indeed required as a basis for a takeover offer. It is true that at that time John Duthie Holdings Ltd was a company with a very strong asset backing but a poor trading record. For the latter reason the shares in the company were available at a low price on the Stock Exchange. It may be that in these circumstances the general possibility of a takeover bid being made by someone at some time or other was a reasonably foreseeable possibility. However, . . . I have come to the conclusion that a mere general possibility of that kind is not sufficient to give rise to a special relationship.

For Cooke J. the financial statements themselves did constitute a sufficient signal. He noted that John Duthie was rich in assets but somewhat unimpressive in earnings and stated:

It was a classic case for a takeover or merger. . . . And it was no less obvious that, as the company was a public one, any takeover would be preceded by a study of the published accounts. It is hardly conceivable that they would be ignored.

For Woodhouse J. the auditors of a public company owed a wider duty of care than one predicated on the nature of signals from the financial statements themselves:

Although an audit is undertaken on behalf of the members of a public company it must be within the reasonable contemplation of any auditor that confidence in its ability to handle its commercial arrangements would depend upon the authenticity of its accounts—a confidence that would disappear if reliance could not be put upon the audit report. So I think that when auditors deliberately undertake to provide their formal report upon the accounts of a public company they must be taken to have accepted not merely a direct responsibility to the shareholders but a further duty to those persons whom they can reasonably foresee will need to use and rely upon them when dealing with the company or its members in significant matters affecting the company assets and business . . . it is sufficient for present purposes to restrict consideration to a takeover offer related, as so frequently is the position, to the value of shareholders' funds. In such a situation the need to rely upon audited accounts is, I think, quite obvious. As a matter of commercial reality I think the auditor and offeror are in a relationship of close proximity.

The position of the small shareholder

One question that arises is whether there is any distinction between the duty of care owed to investors acquiring a controlling interest and those purchasing smaller parcels of shares. Only in the *Twomax* case was an action brought by purchasers of relatively small shareholdings, and here Lord Stewart did envisage the possibility of differing levels of care:

There may or may not be a distinction between the position of the first pursuers, Twomax, who took over control of the company and that of the other pursuers who merely purchased smaller shareholdings.

However in this particular case he held that there was no material difference:

I do not consider that I need make any distinction between the position of Twomax and that of the other two pursuers Mr Goode and Mr Gordon. These two gentlemen were acquiring holdings in Kintyre of smaller proportionate value than were Twomax and, in particular, were not seeking to acquire a majority shareholding. Nevertheless, they were potential investors who eventually did invest in Kintyre on the strength of the audited accounts just as Twomax did.

In *Scott v. McFarlane* caution was expressed as to the position of smaller shareholders whether buying shares as a result of a newspaper report or first hand inspection of a set of company accounts; per Woodhouse J.:

there would seem to be formidable difficulties for a plaintiff who attempted to prove that an auditor should have foreseen the plaintiff's likely reliance upon some newspaper or a stock exchange reference to a company's accounts;

and per Cooke J.:

A company purchasing all or the majority of the shares is more directly and closely affected than, for instance, an ordinary purchaser of shares on the stock market. And in all ordinary circumstances there will in fact be only one offeror who makes a successful takeover offer on the basis of the carelessly certified accounts. There is no need to express an opinion on the perhaps unusual case of an ordinary market purchaser who first makes a careful study of the audited accounts or even on the case of a quite unforeseeable takeover.

Small investors are perhaps less likely to place reliance on audited financial statements than substantial investors. However, apart from this, there does not appear to be any clear argument for distinguishing the auditor's responsibility to small and large investors. While of course the more shares purchased the greater the potential total loss, it is quite conceivable that a small shareholder with only one investment might suffer greater hardship than, say, an institutional investor with diverse holdings and diverse ownership. Even if one disregards welfare considerations of this nature it is difficult to find support in other areas of the law for the contention that redress for wrong is determined by the level of absolute loss.

In the US the *Panzirer* case has been held out, e.g. Murray (1985), as an illustration of the willingness of the courts to accept arguments based upon the integrity of the market, i.e. that a prospective purchaser can place reliance upon the ability of the market to process efficiently available

public information, including a negligently prepared audit report. Indeed in the case the court appear to have accepted than an enquiry to a broker as to whether there was any 'negative news' about a share 'might suggest that the market's integrity was material to the plaintiff'.

Contributory negligence

Prior to 1945 a plaintiff's action in tort was barred if his negligent conduct was a joint cause of the initial damage and therefore of the wrong itself. The 1945 Contributory Negligence Act was passed so as to ensure that parties which suffered loss as a result of a course of events in which they were partially at fault could in fact recover a proportion of damages from the party with the greater degree of fault (relative to the outcome in terms of loss to each party). Whether the 1945 Act also applies to actions in contract has been a subject of legal controversy (see e.g. Swanton, 1981). In the only UK auditing case (in the sense that the defendants were the auditors of the plaintiff although the contractual services in question were additional to those of external audit) *De Meza & Stuart v. Apple Van Straten, Shena & Stone* (1974) the Act was applied, Brabin J. holding that as the contract imposed a duty of care the Act was applicable. Although this case went to appeal neither party wished to dispute the apportionment finding (an interesting example of risk aversion and risk preference on behalf of the parties). The Appeal Court was anxious to avoid taking a position on this point, Roskill L. J. stating:

This, if I may be permitted to say so, has been a controversial point certainly for as long as I can remember since 1945. It has to my knowledge been argued more than once in this Court, though never decided.

All three judges concurred that their decision (to uphold the decision of the lower court) did not imply agreement that apportionment was possible under contract. Contributory negligence in contract was also pleaded in the later Australian auditing case *Simonius Vischer*. Here the court decided that in fact there had been no negligence on the part of the plaintiffs and that it was not therefore necessary to decide whether apportionment was available under contract (or whether auditors could be sued by a contracting party under either contract or tort).

The decision in *AB Marintrans v. Comet Shipping* (1985) (a non-accounting case) suggests that in English Law apportionment is not possible and a contractual claim stands or fall in its entirety (although the general applicability of this decision has been questioned in the recent *Forsikrings Vesta*

v. Butcher (1986) case). The law has moved toward allowing actions to be framed under either tort or contract (as in *Esso Petroleum v. Mardon* (1975)—although the recent *Tai Hing* case may indicate a reversal of this position (Holyoak, 1986)). This may give rise to certain anomalies as was recognised by Neill L. J. in his judgement in the *AB Martintrans* case:

I appreciate that the construction which I have adopted may well lead in some cases to unsatisfactory results. Thus it may be that a plaintiff will be able to avoid the apportionment provisions by suing in contract when a claim in tort would be as or more appropriate.... Indeed, I see great force in the contention that the same rule should apply to claims whether they are based in contract or tort where the act complained of involves the breach of a duty of care.

Actions by third parties against auditors clearly lie in tort and it is therefore instructive to consider whether certain action or inaction by the plaintiff might act to reduce any damages awarded against the auditor. Although he does not mention contributory negligence, Lord Wilberforce's considerations (in the *Anns* case) that ought to negate or to reduce or limit the scope of the duty or class of persons to whom it was owed might be construed as including contributory negligence by the plaintiff.

In the cases specifically considered above, contributory negligence on behalf of the plaintiff was apparently directly pleaded in the *JEB Fasteners* case alone. However, in all these cases the courts discussed the nature of enquiries made by the plaintiffs and their knowledge of the circumstances of the company over and above the information contained in the audited accounts.

In *JEB Fasteners* Woolf J. considered the legal position to be as follows:

It was argued on behalf of the defendants in this case that, if contrary to their primary contention they were under any liability to the plaintiffs, then the plaintiffs were guilty of contributory negligence. The plaintiffs contended that the Law Reform (Contributory Negligence) Act 1945 did not apply to actions founded on an allegation of negligent misrepresentation.... The words of S1(1) of that Act are in very wide terms and I can see no reason why those terms are not sufficiently wide to cover a case involving negligent misrepresentation.

He linked the issues of contributory negligence and reliance as follows:

I do, however, recognise that it may well be that in the case of negligent misrepresentation the scope for contributory negligence is limited since an auditor will only be liable if he should foresee that someone might rely on his accounts and, as I have sought to indicate, this involves it being reasonable for the person concerned to rely on the accounts. If it is reasonable to rely on the accounts, it is difficult to envisage circumstances where as a matter of fact it would be negligent to do so without taking further steps to protect yourself from the consequence of relying on the auditor's certificate.

It is unclear how this statement should be interpreted in the light of the need for potential investors to make enquiries as to the financial health or otherwise of a business beyond the figures in the audited accounts. In the *Haig* case the plaintiff discussed the financial statements with his bank manager and with a chartered accountant (he also visited the business and inspected the work in progress). In *Scott v. McFarlane* enquiries beyond the accounts were limited to inspection of publicly available records and an attempt to estimate market values of properties known to be owned by John Duthie. Here it is probably relevant that the nature of the accounting error was such that it is most unlikely that it would have been uncovered by general business enquiries: indeed Woodhouse J. noted the restrictions placed on third parties seeking to verify accounts:

There is no opportunity in the ordinary case for any intermediate examination of the underlying authenticity of a company's accounts. Nor would it be practicable for numbers of persons to make independent examinations on an individual basis.

In *Twomax* only one of the aggrieved parties made any serious enquiries, Lord Stewart noting:

In fact, paradoxically, it was Mr Gordon, the smallest investor, who was the only pursuer, so it appears, to seek outside advice upon the advisability of his contemplated investment. Even then, the accounts audited by the defenders, or a draft thereof, were the only documents he relied upon.

In *JEB Fasteners* the plaintiffs also faced the problem of obtaining information, Woolf J. noting:

It is true that, in addition to what his own stock valuation had shown, Mr Bufton had only

limited information available. Mr Bufton said that the books were not made available to him and he had difficulty in getting information, and this I accept.

However, it was the enquiry Bufton was able to make concerning the stock take in June 1975 which had a crucial effect on the outcome of the case, Woolf J. holding that *JEB Fasteners* knew that the figure in the accounts was questionable prior to the takeover and that therefore they could not be said to have relied upon it:

Even though the condition of the stock in June 1975 was not necessarily the same as it had been in October 1974, stock in that condition, when contrasted with the valuation placed on it, would have made a director as careful as Mr Bufton unwilling to proceed unless, as I think was the case, he really was prepared to acquire the company if its financial position was that which should have been shown in the accounts at October 1974, if they had shown the true position.

This view was supported by Stephenson L. J. in the Appeal Court:

'I relied on his figure of [£23,000 for the value of the stock]. It is as simple as that,' said Mr Bufton. I agree with him that it is as simple as that. If he did, the plaintiffs should have had judgment. Only if he did not was the judge right.

In the *Lloyd Cheyham* case, in which contributory negligence as such was not an issue, Woolf J. concluded his judgement with a number of remarks which indicated the importance that he placed upon the need for those seeking to place reliance upon company accounts to protect themselves—remarks which, on the face of it, suggest a shift in his opinions since the *JEB Fasteners* case:

However, before I complete this judgement there are three things I wish to add. . . . The second is that while Mr. Anderson no doubt believed in the merits of the claim in fact he was placing a wholly unjustified responsibility on the auditors. He failed to obtain the usual warranties or make the usual inquiries before investing in Trec and then sought to blame his loss on the failure of the auditors to provide him with the protection that he did not provide for himself. While it is right that auditors should exercise a duty of care to those who they appreciate will rely on their audited accounts this duty does not mean that a purchaser need not exercise any care to protect himself.

The role of the directors

It is a commonplace among practising auditors that those primarily responsible for the truth and fairness of company accounts are the company directors and that litigation should be directed against them rather than against the auditors. It has been suggested that compulsory indemnity insurance schemes for directors would steer toward them claims which are currently brought against auditors on the grounds of their greater financial resources.

There is no doubt that, in the UK, Sections 227–230, 239 and 245 of the Companies Act 1985 do make the directors individually and collectively responsible for the provision of accounts showing a true and fair view. In these circumstances it may be open for contractual actions to be brought by the company against directors or for third parties to bring actions in tort. In tort where wrongdoers jointly cause damage (and the provision of inaccurate accounts with an unqualified audit report attached might be seen as jointly causing damage) it is open to the aggrieved party to sue either one of the wrongdoers for the full amount of the damage. In these circumstances if aggrieved parties choose to litigate against the auditors alone then the remedy open to the auditors is to seek apportionment with the directors under the aegis of the Civil Liability (Contribution) Act 1978. This provides that any person liable in any damage may recover a contribution from any other person liable for the same damage. It also allows for a contribution claim from another wrongdoer where a wrongdoer has made a bona fide settlement with the injured party without necessarily admitting liability (a provision that may have important implications as the great majority of claims against auditors are settled out of court). (For further discussion of the working of the Act see Dugdale & Stanton, 1982.)

Although the requirements of statute are clearly stated it is not clear how these would be interpreted by courts which have traditionally been reluctant to make the duties of the director too onerous. In the leading case *re City Equitable Fire Insurance* (1926) it was held that the larger the business carried on by the company the more numerous and the more important the matters that must of necessity be left to the managers, the accountants, and the rest of the staff. Although more recent cases (e.g. *Dorchester Finance v. Stebbings*, 1977) have suggested higher standards of care, in the *Andrew Oliver* case Lord Stewart followed closely the judgment of Romer J. in the *City Equitable* case. Lord Stewart stated:

Here a sharp distinction must be made between the defenders [the directors] and the second third party. It is not difficult to appreciate what

were the duties of the second third party as a skilled accountant.... The situation of the defenders is completely different. The pursuers' pleadings are silent upon any special skill or knowledge they might have possessed....

In these circumstances, I have difficulty in understanding what is the real content of the rather vague averments that they should take reasonable care 'to see to it' that the accounts gave a true and fair view of the state of the company's affairs, and of the averment that they had a duty 'to satisfy themselves as to the accuracy of the said accounts'.... What in fact were these defenders supposed to do to discharge these duties? Should they have made random checks on the book-keepers' work or hovered at the elbow of the chartered accountant as he prepared the profit-and-loss account and the balance sheet?

It may be argued that the wording of Section 245 of the Companies Act 1985 suggests that the directors of a company act as guarantors of the truth and fairness of the financial statements of a company. It is, however, equally arguable that the Courts would interpret the Companies Act provisions within the normal scope of a duty of reasonable care and skill. Consequently, they may be reluctant to hold a director, who in good faith signed a set of accounts which had been prepared by qualified accountants of good reputation, liable for the failure of those accounts to show a true and fair view. (This argument is strengthened by the fact that Section 245 allows as a defence proof that directors took all reasonable steps to ensure compliance with the requirements of the Section.)

Disclaimer clauses

Can auditing firms make use of clauses disclaiming liability? Section 310 of the Companies Act 1985 prohibits any attempt to exempt (or to indemnify against) the auditor of a company from any liability in respect of any negligence, default, breach of duty or trust of which he may be guilty in relation to the company. From reading the Section it is not entirely clear whether it has effect with respect to disclaimers of liability to third parties. The Section applies to 'any provision, whether contained in a company's articles or in any contract with the company or otherwise'. Nor is it clear how, in the light of this Section, the Courts would interpret the contractual position of those clauses in the standard letter of engagement which seek to clarify the limited nature of the auditor's work with respect to the detection of fraud.

If it is accepted that Section 310 does not apply to third party disclaimers then it may be possible for auditors to restrict their liability by the use of

such disclaimers. In the *Hedley Byrne* case the presence of a disclaimer clause was a significant factor in the ultimate failure of the plaintiffs' case. The disclaimer read:

Confidential. For your private use without responsibility on the part of this bank or its officials.

Nowadays it is necessary for a disclaimer not to be rendered ineffective by the Unfair Contract Terms Act 1977 as, despite its title, this Act applies to negligence liability to third parties just as much as to contracting parties (although not apparently in Scotland). This Act applies a 'reasonableness' test to any such disclaimer and it is debatable whether the current state of the law would consider the complete disavowal of responsibility to all third parties to be reasonable. However, in the *Scott v. McFarlane* case two of the Court of Appeal judges (Cooke J. and Richmond P.) were prepared to contemplate the possibility of a disclaimer; in the words of Cooke J.:

Nor would there be any difficulty in appending a disclaimer of general liability to the auditors' certificate.

However, neither judge was entirely in favour of the use of such clauses. Cooke J. continued:

Perhaps some auditors, naturally jealous of their professional reputation, would hesitate to announce such a disclaimer, nor do we know what the attitude of the stock exchange might be. But if there were any reservations of that kind they would only serve to underline that reasonable people thought that liability for negligence should be accepted.

and Richmond P. was clearly against the use of such disclaimers:

Furthermore, it is not in the public interest that the courts should bring about a situation in which accountants and auditors will feel obliged to resort to the device of a general disclaimer as negating an assumption of responsibility. Such a disclaimer, if effective, will prevent claims in cases where the law would otherwise hold that the defendant ought properly to be regarded as having assumed a special responsibility. I would prefer that this branch of the law be left in a state where professional men of integrity can feel confident that they will not be held liable except in situations where they were indeed aware of a specific purpose for which their advice and assistance was required.

One final topic of interest in the disclaimer field lies in the wording of Section 11 of the 1977 Act.

This states that where a disclaimer is expressed in terms of limiting liability to a specific sum the courts, in determining whether this disclaimer is reasonable, will consider both the financial resources available to the party seeking to reduce liability and also the level of insurance open to the party. Whilst there may be a certain intuitive appeal in a link between liability and the means to pay, it is not immediately clear why there should be differing levels of responsibility dependent upon size in situations where the negligent act might have been identical. The insurance argument seems similarly flawed. Levels of insurance cover are directly correlated with premiums paid; there are few activities for which large sums of insurance cover are not available if the premium is high enough. Where the courts have discussed the relevance of this section (e.g. in *Mitchell v. Finney*, 1983—a non-accounting case) they have, not surprisingly, been unable to shed much further light on its actual application. If smaller accounting firms were to seek to limit their liability to specific amounts then it would be necessary for there to be further clarification of the practical significance of this section.

Conclusions

The development of case law in the field of the auditor's liability to third parties for negligent misrepresentation has left a number of unresolved issues. The whole question of when the auditor should know that third parties are likely to rely upon the financial accounts is strewn with artificial distinctions many of which appear to have been constructed with the benefit of hindsight; for example, in relation to knowledge of capital requirements, of the likelihood of takeover, and of the intended sale of shares. Of these, perhaps the most artificial is knowledge of the likelihood of takeover. In the *Scott v. McFarlane* case, high assets and low profitability were seen to signal the likelihood of a takeover. Takeovers occur for a multitude of reasons (e.g. for diversification, to remove competition, to obtain good management), and it is unclear that predictive models as to the likelihood of takeover of public companies are sufficiently reliable to be used in such a general test.

Similar arguments apply in the case of capital requirements. Companies may require capital for a variety of purposes (e.g. to shore up a failing business, or as a spring board for expansion and diversification), and it is not necessarily the case that the auditor can predict the likely requirement for capital.

It is also questionable whether there is any valid distinction between actual and constructive knowledge of the sale of shares. In the *Twomax* case, it was held that the auditor knew that a transaction was going to take place in Kintyre's shares. Is this

very different from the case of an auditor of a public company who knows that share transactions will take place and that one influence on the share price will be the company's most recent audited financial statements? Are there in fact genuine differences between the responsibilities of an auditor of a private company and those of the auditor of a public company? Is there a logical distinction between the duty of care owed to a purchaser of 1% of a company's share capital and that to a purchaser of 50%?

A further wide area of uncertainty encompasses the scope of enquiries that it is reasonable to expect a potential purchaser (or lender) to make. In the *Scott v. McFarlane* and *Twomax* cases, enquiry was effectively limited to a study (detailed in the *Scott v. McFarlane* case but apparently cursory in the *Twomax* case) of the published accounts. In the *JEB Fasteners* case the plaintiffs studied the accounts and went to the trouble of conducting their own stock check. In the *Lloyd Cheyham* case certain enquiries over and above a study of the accounts were made by the plaintiff. Whilst in the first two cases the courts were prepared to accept that the plaintiffs were entitled to rely upon the published accounts, in the *JEB Fasteners* case the additional enquiries made by the plaintiff lost them the case, and in the *Lloyd Cheyham* case the plaintiff, whose case was lost anyway, was criticised for failing to take adequate steps to protect himself.

The circumstances of individual cases are different and the courts have often warned against generalisation in the field of negligence. Nevertheless it might be construed that certain of the apparent anomalies are not necessarily those alluded to by Lord Devlin in his *Hedley Byrne* judgement, i.e. those arising out of the need even in the best system of law to draw nice distinctions between borderline cases. Rather the anomalies may be indicative of the difficulties that courts have had in reconciling the need of third parties to be able to rely upon audited financial information with the need to avoid exposing the profession to unlimited liability to all parties.

It has been argued that this latter vision of a profession swept away as the floodgates of liability open, a spectre so clearly articulated by Judge Cardozo, is an exaggeration and should not be allowed to stand in the way of the acceptance by the auditing profession of appropriate responsibilities. This was clearly the view taken by Woodhouse J. in the *Scott v. McFarlane* case when, in reference to Judge Cardozo's famous dictum, he stated:

the attraction and force of the language ought not to lead to uncritical acceptance. . . . It is, of course, substantially a plea in mitigation on behalf of [auditors] that they should be alto-

gether excused from liability for their negligent conduct because the consequences are too serious to justify responsibility. It may be regarded as a rather one-sided argument, particularly when it is set up in favour of those who are in business to give advice.

The auditing profession has flourished in an environment of statutory support and protection (some might say 'cocooned' in such an environment). One of the mainsprings for this statutory support has been the role of the auditor in improving the quality of information available to the capital markets and in the protection of those parties seeking to rely upon this information. Another has been the recognition that there are significant economic advantages in the collective provision of such information rather than allowing individual parties to contract separately for the information. In such circumstances it does not seem unreasonable for auditors to owe certain responsibilities to those parties who customarily do rely, directly or indirectly, upon the information contained in audited financial statements; nor is it necessarily appropriate to expect such parties to protect themselves against negligent work by auditors by means of detailed further enquiry.

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Table of Contents

Volume 10, Number 1
September 1987

Editorial Data

Linda Elizabeth DeAngelo

Managerial Competition, Information Costs, and Corporate Governance:
The Use of Accounting Performance Measures in Proxy Contests

Jilnaught Wong

Political Costs and an Intraperiod Accounting Choice for Export Tax Credits

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Analysts' Forecasts as Earnings Expectations

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Experimental Research in Auditing: Field vs. Laboratory Settings

Keith A. Houghton and Peter Robinson*

Abstract—This paper reports a laboratory study which replicates an earlier field based study reported in this journal (Houghton, 1983). The conclusions of the laboratory study are identical to those reported in the field study. Specifically, the studies find that while the presence and content ('clear' versus 'subject to' qualification) of audit opinions do not have a significant impact on the loan decisions of corporate bankers, they do significantly influence the decision processes of those bankers.

Prior research on the information content of audit reports has yielded contradictory and inconsistent conclusions. In a comprehensive examination of this literature, Craswell (1985) noted that many of the research studies undertaken were plagued by significant problems in experimental design.

Bailey (1982) addressed the issue of experimental design and argued that security price research was an inappropriate means of investigating the information content of audit reports, and that research conducted in field or laboratory settings was more appropriate.

Field versus laboratory settings

The choice between a field and a laboratory experimental setting is not an easy decision to make. An extensive literature in research methods examines the relative advantages and disadvantages of each approach. Kerlinger (1973, p. 402) contrasts the two settings and suggests that, depending on the realism of the research task, experiments conducted in a field setting are more likely to yield stronger variables and results generalisable to other situations than those of laboratory experiments.

However, Kerlinger (1973, p. 402) notes:

The control of the experimental field situation is rarely as tight as that of the laboratory experimental situation only.... The investigator in a field situation, though he has the power of manipulation, is always faced with the unpleasant possibility that his independent variables are contaminated by uncontrolled environmental variables.

Yet while the laboratory experiment provides the researcher with the possibility of complete

experimental control, it suffers from the problems of artificiality and threats to external validity (Kerlinger, 1973, pp. 398-400). Fromkin and Streufert (1976) provide an in depth examination of the laboratory as a research site and conclude that the problem of artificiality in laboratory experimentation can be circumvented (p. 441). However, threats to external validity cannot easily be avoided. Gorman, Clover and Doherty (1978, p. 168) suggest that, from a practical viewpoint, laboratory studies employing only facsimiles of the real world may prove to be little more than interesting demonstrations. In a similar sense, Ebbesen, Parker and Konecni (1977, p. 589) note:

The generality of a model or result is an empirical issue that cannot be overcome simply by employing simulations with greater face validity.

If the external validity of a laboratory experiment represents its most serious threat (Kidder, 1981, p. 25), then researchers employing the laboratory experimental setting must buttress their results by providing external validity evidence (Ebbesen, Parker and Konecni, 1977, p. 589; and Ebbesen and Konecni, 1980, pp. 42-43). For Kidder (1981, p. 25) the best test of external validity is by replication—with different subjects, different procedures and different experimenters.

The study reported here replicates a prior field study of the impact of various types of audit opinion on the decisions made by bank lending officers (Houghton, 1983). But, rather than using a field experimental situation, this study employs a laboratory setting for the experiment. The objectives are (a) to consider whether the findings of the prior field study reported by Houghton (1983) are robust and (b) to obtain evidence concerning the problem of external validity in laboratory experiments.

*The authors gratefully acknowledge the helpful comments of Bob Walker, Ken Trotman and Don Stokes (of the University of New South Wales) and two anonymous referees of this journal.

The experiment

The research instrument used in this study was identical to that used by Houghton (1983). The information provided to all subjects comprised a complete set of financial statements containing comparative data for three years—the minimum historically used by Australian bankers when considering a loan application. The information included balance sheets, income and funds flow statements, and all mandatory disclosures and statutory declarations. As with Houghton (1983), the variable that was manipulated was the audit information. One group of bankers received an audit report which included an unqualified or 'clean' audit opinion, a second group was given a qualified opinion (the qualification was of the 'subject to' variety and involved the possible effects of a claim on the company by a former employee), and the third group was provided with no audit information. Under Australian corporate law, proprietary companies can be exempted from the requirement for external audit if certain conditions are met (e.g. the company is not owned by or associated with a public company). The case company presented in the experiment did not fall within this exempt class for the first two groups; however, for the third group it did appear to be within this class. It is important to note that all subjects would have had experience in lending to both exempt and non-exempt proprietary companies and would have been familiar with each type.

Consistent with the decision process of Australian bankers, the subjects' task was to approve or decline the loan application for a specified sum (\$60,000). In addition, they were asked to specify:

- (i) the steps they took to process the application,
- (ii) the reasons for coming to their decision, and
- (iii) certain biographical details including age,

education, and experience in banking and lending.

The experiment was run in conjunction with a non-credit course on financial information and bank lending decisions. Fifty-one bankers were enrolled in this course, and all volunteered to participate in the experiment.¹ The three groups were of equal size (seventeen subjects each) and subjects were randomly assigned to one of the three treatment groups.

Biographical characteristics

The biographical profile of the three groups is shown in Table 1. Differences between groups was assessed by use of analysis of variance. The ANOVA results (F value and level of significance) are also shown in Table 1.

As can be observed, Group 2 had, on average, fewer years in banking and, probably as a consequence, fewer years in lending than the other two groups. Consistent with previous Australian studies using bankers as subjects (e.g. Houghton and Guidicatti, 1982), the bankers commenced their employment in the banking sector at an average age of between 17 and 19 years, and had some 10 to 12 years banking experience prior to becoming involved in lending.

The analysis of variance showed that there were no significant between-group differences for the biographical variables. One can conclude, therefore, that the three groups were similar with respect to age and relevant banking and lending experience. Thus, it would be reasonable to assume that any experimental differences would not be caused by group differences in subjects' experience or skill in completing the required tasks.

The loan decision

The bankers seemed to have some clear steps through which they passed before coming to their decisions. Some 92% of all subjects specifically stated that they employed ratio analysis in processing the information presented to them. In addition, it was very common for the subjects to state that they: evaluated the applicant's need for the funds; assessed the adequacy of the security offered (and/or available); and examined the applicant's financial ability to service the loan if approved. A minority of subjects stated that the steps they used included: an assessment of company growth in the future (18% of subjects), an assessment of the lawsuit (also described as the contingent liability) (10%); and an examination of the auditors' report (6%). Interestingly, almost all those subjects who fell into these last two categories were amongst the 17 subjects who received the information containing the qualified audit report.

In relation to the reasons for coming to their

¹As the present study was conducted in the same geographic area as that of Houghton (1983), care was taken to ensure that the results were not markedly affected by the introduction of a test effect. That is, the present researchers set about to check if any of the subjects were respondents in Houghton (1983). So as to ensure confidentiality of the responses from that earlier study, this checking was undertaken by the author of that previous study. In fact only 3 of the 51 had been respondents and each of these 3 had responded in the same way as before. A fourth subject may also have been a respondent in that earlier study, however this could not be determined with certainty. That subject's name was very similar to but not identical to a respondent in the earlier study. It should be observed that exclusion of these subjects made no difference to the conclusions drawn in this paper. In addition to these subjects, a further three had been non-respondents in Houghton (1983). It could be noted that if the study had not been conducted in the same geographic area, this may have introduced a potential confounding variable that could have limited the validity of the comparison between the results of the present study and those of the earlier field experiment.

Table 1
Biographical profile of the three groups and measures of between-group differences

	<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>	<i>F</i>	<i>Sign</i>
age (years)	39.2	36.1	38.4	0.570	0.570
years in school	11.4	11.0	10.9	0.391	0.679
years in banking	20.6	17.4	21.3	0.754	0.476
years in lending	10.1	7.5	8.2	0.774	0.470

Table 2
Bankers' reasons for loan decision

<i>Reasons Given</i>	<i>% of Bankers</i>	
	<i>Primary*</i>	<i>Other*</i>
Good financial profile	39%	33%
Poor financial profile	8%	18%
Adequate ability to service debt	10%	18%
Inadequate ability to service debt	24%	25%
Inadequate security	29%	37%
Contingent liability/lawsuit	—	6%
Existing connection with bank	6%	14%
Lease commitments	—	8%
Other	6%	10%

*Given that multiple responses were possible, the columns sum to greater than 100%.

decision, the bankers were asked to give multiple answers, divided into reasons which were primary to their decision, and other reasons. Their responses are described in Table 2.

As can be seen from Table 2, many bankers saw the applicant in a favourable light, and many in an unfavourable one. Overall, a large group of bankers saw some difficulty in the applicant's ability to service the debt. In all, 47% of the subjects approved the loan (24 out of 51 bankers). The results for the between-group differences in decision outcome (approve/decline the loan application) and decision process (frequency with which subjects, in specifying the steps or processes used to arrive at their decision, made reference to the audit report or the topic of the audit qualification) are reported in Table 3. Comparative results from

Houghton (1983) are also given. Consistent with those previous results, neither the presence nor content of the audit report made a significant difference to the loan decision outcome. The approve/decline proportions were evenly spread over the three groups, with eight bankers (47%) in each group approving the loan. However, the presence of the qualified report did give rise to a significant difference in the stated decision process when compared with the clean and no audit report conditions. For both comparisons, the presence of the qualified audit report was associated with subjects being sensitised to the presence of the audit report and/or the topic of the qualification.

As can be observed from the comparison between the results of this study and those in Houghton (1983), the presence/absence of

Table 3
Between-group differences: audit information

		<i>Present Study</i>	<i>Houghton (1983)</i>
		<i>Chi Sq</i>	<i>Sign</i>
(a) No audit report/ Qualified audit report	Decision outcome	0.00	1.00
	Decision process	4.50	0.03
(b) Clean audit report/ Qualified audit report	Decision outcome	0.00	1.00
	Decision process	4.50	0.03
(c) No audit report/ Clean audit report	Decision outcome	0.00	1.00
	Decision process	0.00	1.00

significant differences (at the 0.05 level) in the laboratory study is identical to the findings reported in the field experiment. Thus, the conclusions drawn from the earlier study could also apply here. In general terms, those conclusions are (a) the existence of a qualified audit report does not necessarily have a sufficient impact upon a bank loan decision to alter significantly the decision outcome, and (b) the provision of an audit report does prompt bank loan officers to take note of the audit report when processing the loan application.

In comparing the results from the two different research sites (field versus laboratory) it can be concluded that, for this audit experiment, the research method employed had no effect on the conclusions drawn. That is, the results obtained in the more controllable laboratory experiment were not different to the results obtained from the field experiment—a research site conducive to higher external validity.

The results have one further aspect of relevance concerning external validity. Although the allocation process of subjects to sub-samples is normally random, a common difficulty in research involving laboratory experiments is that the subject sample selection process is non-random. Often such experiments are run in conjunction with some educational activities (see for example Casey, 1984; and Houghton and Sengupta, 1984) and these circumstances may lower the external validity of the results obtained. However, in the present study, where the subjects were participants in an educational course, the results were consistent with the field experiment of Houghton (1983). It should be remembered that in the study undertaken by Houghton (1983), six of the seven banks then trading in the state of Western Australia were involved and approximately half of the total population of bankers participated.

In addition to testing for an association between the decision process and outcome on the one hand and audit information on the other, this study was also able to test for an association between bank employment affiliation and the decision process and outcome. If an association were found, it would suggest that certain bank(s) may have educational programmes and/or procedures manuals which may reflect important differences in relation to the presence and content of audit opinions. The presence of such an association, would, however, not pose a threat to the general results reported above. This is because of the random assignment of subjects to treatment groups. In any event, no statistically significant association (even using a 0.15 level of significance) was found between either the measures used to examine the decision process or decision outcome and the subject's employment affiliation. That is, this study found no significant between-bank differences in the subjects' decision processes or outcomes.

Summary and conclusion

The present research sought to:

- (1) examine the impact of audit reports on the bank lending process and thereby test the robustness of the conclusions of Houghton (1983); and
- (2) examine the impact of the experimental setting: field versus laboratory.

The results from this laboratory experiment were entirely consistent with those from the field-based study of Houghton (1983). Therefore the conclusions were also the same. That is, whilst the presence and content of an audit report may not impact upon the loan decision outcome, the presence of a qualified audit report significantly impacts upon the stated decision process of the lending bankers. This implies that bankers do at least scan audit information to determine the presence and, possibly, the nature of any qualification.

In terms of research method, the study provides evidence on two issues. First, as previously observed, no differences were observed between the results from the highly controlled laboratory experiment and the field experiment. This may be important to those who must face a choice between the two settings. Secondly, the study also produces evidence on the oft-cited potential problem of subject selection. The selection procedure in Houghton (1983) involved a significant proportion of the population of lending bankers in the region, whereas the procedure in the present study involved the non-random selection of a more modest number of bankers. But there was no discernible impact on the results from the non-random selection procedure used in the laboratory experiment.

There is still considerable research required to assess the impact of audit reports on users (with respect to decision outcomes and the more subtle decision processes) and on the effect of different experimental settings. In particular, further research could address the question of which audit qualification influences users' decisions and which do not. One might also conduct such studies in both field and laboratory settings and test the reliability and generalisability of the results reported here.

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Journal of Business Finance & Accounting

Autumn 1987

Vol. 14 No. 3

/ Contents

Incentives to Introduce a Cost Reducing Technology in a Decentralised Organisation
by M. B. GIETZMANN

The Effectiveness of Incorporating Stability Measures in Company Failure Models
by J. BETTS AND D. BELHOUL

Non-Financial Symptoms and the Prediction of Small Company Failure: A Test of Argenti's Hypotheses
by K. KEASEY AND R. WATSON

A Comparison of Cross-Sectional and Time-Series Beta Adjustment Techniques
by NEAL L. USHMAN

A Test of the APT in Pricing UK Stocks
by SARAH P. ABEYSEKERA AND ARVIND MAHAJAN

New-Issue Costs and Project Evaluation: Ezzell and Porter Revisited
by A. WIRTH AND F. K. WRIGHT

Corporate Demands and Changes in GPLA
by EHSAN H. FEROZ

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by JAMES W. WANSLEY AND WILLIAM R. LANE

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The Search for Correspondence with Economic Reality: A Review Article

T. A. Lee

Accounting has been touched and influenced by a multitude of events and people. Arguably, the most important of these is people. Whilst events usually give rise to problems requiring accounting solutions, it is people who provide the thinking and the action to produce the solutions.

Much has been written of the significant roles played by individuals in the development of accounting thought and practice. The most recent is the overview by Zeff (1987) of the leadership provided by fourteen individuals to the American profession. Some were practitioners—for example, May, Montgomery and Spacek. Others, such as Barr, Carey and Werntz, were involved mainly with professional or regulatory bodies. Yet more were academics—Paton and Littleton. Despite these occupational differences, they had one thing in common: they used the written word generally, and the accountancy literature particularly, to influence accounting progress. In each case, the written contribution was continuous and extensive.

If such a selection is representative of individual influence in accounting, it would appear that significant leadership demands at least some attention to the power of the pen. Other evidence supports this point: the influence, for example, of practitioners such as de Paula and Garnsey (Kitchen and Parker, 1980). The influence on accounting thought of Chambers follows in this tradition (Chambers and Dean, 1986).

Chambers: an overview

Since entering academe in 1945, and publishing for the first time in 1947, Chambers has had a singularly consistent and persistent influence on the shape of accounting thought. Arguably, his greatest contribution has been in the formulation of accounting theory—not just in the specific theory which he prefers and develops, but also in the way in which accounting theory is formed and argued. Perhaps his most significant influence is yet to come: when his structured theory is put into practice.

Again it can be argued that Chambers has been one of the most influential theorists of his time. He is a representative of what has become known as a golden age of accounting theory (the 1950s and 1960s), and his contribution has been in two main areas. The first concerns the need to rigorously construct accounting theories and arguments in a scientific manner. The primary evidence of this is in *Accounting, Evaluation and Economic Behavior* (1966). Only one other academic of the period has had such an influence in this respect, and that has been Sterling (1979).

The second contribution has been Chambers' concern to point out the frailties of and solutions to accounting by observation of the way people and organisations behave in management and accounting. His best known work in this respect is *Securities and Obscurities* (1973).

Chambers has been honoured by both his fellow academics and his professional colleagues. He has been much involved in professional and academic matters. Indeed, his most recent biography reveals a man who finds it difficult to separate the two areas—or merely prefers to ignore the distinction.

This review of his work will attempt to reflect Chambers in terms of his approaches to scientific theorising and observation; and also his unique contribution to both academic and practical accounting. As such, Chambers is very much in the mould of academic practitioners of the past, and has obviously been influenced by their writings.

Chambers: the writer

With the considerable help of Dean, Chambers has selected a number of his writings to represent his contribution to accounting theory and practice (Chambers and Dean, 1986). To follow his approach of correspondence with reality, the following are a few relatively objective data:

- The collection is in 5 volumes. It weighs 8.5 lbs and is 5.75 inches in depth. It includes 153 separate reproduced writings, and these occupy 2,066 pages.

- The writings cover the period from 1947 to 1985. They represent a selection from over 200 items.
- The volumes are titled, respectively, (1) Accounting Management and Finance (24 items, 346 pages); (2) Accounting Practice and Education (34 items, 384 pages); (3) Accounting Theory and Research (41 items, 496 pages); (4) Price Variation Accounting (26 items, 333 pages); and (5) Continuously Contemporary Accounting (28 items, 507 pages).

In terms of Chambers' well-known advocacy of continuously contemporary accounting, it is perhaps surprising to see only one volume (20%), 28 items (18%), and 507 pages (25%) devoted to the subject. But, as Chambers would agree, correspondence with reality is a process which cannot be achieved easily.

Chambers: the writings

An analysis of the 153 items in the collection provides a number of interesting insights into the writings of Chambers. Essentially, they are concerned with two main areas of thinking: first, challenges to traditional accounting theory and practice and, secondly, advocacy of continuously contemporary accounting. Dean and Chambers may have decided to separate the items into five main areas, but the subject matter is twofold, as Table 1 reveals.

In each of Volumes 1 to 4, the major emphasis is challenging the frailties of traditional practice, with a considerable minority concerned with Chambers' favoured solution. The fifth volume is totally concerned with the latter. This is arguably a rather naive analysis, but, in its simplicity, it reflects the single-minded nature of Chambers with respect to conventional practice and its remedy.

Chambers: the approach

Chambers is usually perceived as a theorist but, as indicated above, he is an accountant concerned with the problems of accounting. Thus his writings reflect a need to theorise and a need to reflect practice. Table 2 provides a flavour of this dual role.

The strong *a priori* and observational strands in Chambers' work is evident in these data, a large majority of each volume falling into one or other of these areas. A priori material forms the largest category, and is the majority of items in Volumes 1, 3 and 5. Observational work is clearly a significant element of Volume 2 on accounting education and practice, which should not be surprising. Of interest, too, is the considerable work in responding to criticisms of his material on accounting theory generally, and continuously

Table 1 <i>Volume</i>	1	2	3	4	5	Total
Challenges to traditional accounting	54%	50%	53%	69%	—	45%
Advocacy of continuously contemporary accounting	46%	29%	47%	31%	100%	50%
Other areas	—	21%	—	—	—	5%
<i>n</i>	24	34	41	26	28	153

contemporary accounting particularly; and Chambers' liking for reviewing the work of other writers. The latter is analysed in Table 3.

The majority of reviews deal with the work of individual accounting and other theorists, and include Bonbright, Canning, Edwards and Bell, Fisher, Ijiri, Littleton and Mattessich. These have proved particularly useful to academics wishing to assess fully the major works of these authors.

Chambers: the sources

The written work of Chambers can be found in a wide variety of sources. These comprise four main categories: refereed journals, professional journals,

Table 2 <i>Volume</i>	1	2	3	4	5	Total
<i>A priori</i> material	54%	17%	59%	27%	64%	45%
Observations of practice	42%	65%	2%	31%	14%	29%
Response to criticisms	—	15%	15%	4%	22%	12%
Reviews of other works	—	3%	24%	19%	—	10%
Letters/poems	4%	—	—	19%	—	4%
<i>n</i>	24	34	41	26	28	153

Table 3 <i>Volume</i>	2	3	4	Total
Work of individual theorists	—	70%	40%	56%
Work of professional and other bodies	100%	20%	60%	38%
Empirical research	—	10%	—	6%
<i>n</i>	1	10	5	16

Table 4

Volume	Non-Australian	Australian	Total
Refereed journals	23%	39%	30%
Professional journals	37%	31%	35%
Contribution to texts	17%	24%	20%
Unpublished material	23%	6%	15%
<i>n</i>	83	70	153

contributions to texts, and unpublished material. Table 4 summarises the position.

Forty-six percent of this collection of Chambers' work has been published outwith Australia, reflecting the international dimension to his work. Of these items, 27 have been in refereed journals (12 in *The Accounting Review* and 7 in the *Journal of Accounting Research*). These are statistics which reflect the high quality of Chambers' work. Few non-US academics have achieved this degree of acceptance in US journals.

Of the Australian based items, the 19 refereed journal items are all in *Abacus* which Chambers has been associated with since 1965. This should not detract from the quality of the items. It is certain that most would have been published in other refereed journals. It should also be stated that Chambers' loyalty to his local professional literature is evidenced by 28 (54%) of his professional publications being either in *The Australian Accountant* or *The Chartered Accountant in Australia*.

Chambers: the timing

Thirty-seven years of academic experience in writing provides a wide spread of contribution and influence. An analysis of this spread reveals this timing distribution (Table 5).

The above figures are unsurprising considering the length of Chambers' academic career from 1945 to the present day. They show a gentle build-up in the 1940s and 1950s (concentrating on what he was most familiar with in practice); develop into the areas of accounting theory, price variation accounting and continuously contemporary accounting in the 1960s and 1970s; and stay with the favoured area of continuously contemporary accounting in the 1980s. Thirty-eight per-

Table 5

Volume	1	2	3	4	5	Total
1940s and 1950s	21%	9%	5%	19%	11%	12%
1960s	58%	29%	41%	19%	18%	33%
1970s	21%	47%	51%	54%	50%	46%
1980s	—	15%	3%	8%	21%	9%
<i>n</i>	24	34	41	26	28	153

cent of the items on accounting theory, price variation accounting, and continuously contemporary accounting have appeared in the 1970s and 1980s. Given the persistence and consistency of his views, however, the influence of Chambers in these matters can be said to have spanned four decades.

Chambers: the influences

The frequent citation of Chambers in the accountancy literature and in student reading lists bears witness to the degree of his influence. But he, too, has been influenced, and it is interesting to speculate from the references in his writings as to who or what provided such an influence. It should be noted in this analysis that the 'influences' were not necessarily positive, particularly with respect to Chambers' favourite pastime of criticising conventional thinking.

The main influences appear to have been:

- In scientific thinking—Cohen, D'Abro, Kuhn and Popper.
- In communication—Cherry, Churchman, Morris and Ogden.
- In economic thinking—Hicks, Keynes, Shackle and Simon.
- In accounting—Canning, Gilman and Paton.

There may have been many more, but these are the most obvious.

Chambers: a conclusion

This can only be an interim conclusion. Chambers may be retired from university service but he continues to think, observe and write. From an academic viewpoint, he has many admirable qualities which can be evidenced in his writings:

- He is logical and presents his arguments in a structured and reasoned manner.
- He points out the lack of logic, structure and reasoning in the arguments of his critics.
- The student of accounting is thus provided with argument and counter-argument.
- Most of Chambers' ideas are based on observations of human behaviour. They have a commonsense touch to them which appeals to the pragmatist but disappoints the academic dilettante.
- Chambers' writings are presented with a clarity that avoids deliberate distortion. The student is rarely led down minor by-ways.
- It is sad to comment finally in this review that, if Chambers had been twenty years younger, and had attempted to develop his thoughts in the way indicated in the writings of these five volumes, it is doubtful if the nature of his work would have found favour with the present generation of journal editors and reviewers.

(particularly in the US). The present obsession with empirical matters of somewhat obscure origins and relevance has squeezed out the accounting theorist. His time will come again, and when it does, the work of Chambers will provide a firm foundation.

These volumes are required reading for all academic accountants and students. Failure to use them will be a failure of the academic spirit so necessary to provide improvements in the relevance and quality of accounting. Chambers is truly a man for all seasons.

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Signalling, Agency Theory and Accounting Policy Choice*

Richard D. Morris

Abstract—Signalling and agency theories appear in the accounting literature to be competing theories. This article demonstrates that they are actually consistent theories, in that one set of sufficient conditions of signalling theory is at least consistent with one set of sufficient conditions of agency theory. Indeed, a considerable overlap exists between the two theories: rational behaviour is common to both; information asymmetry in signalling theory is implied by positive monitoring costs in agency theory; 'quality' in signalling theory can be defined in terms of agency theory variables; and signalling costs are implicit in some bonding devices of agency theory. Examples are given where both theories' predictions about lobbying, accounting choices, and voluntary auditor selection are added together.

Introduction

In recent years, two seemingly competing theories have appeared in the accounting literature. Agency theory,¹ which describes the incentive problems in a firm caused by the separation of ownership and control of resources (the principal-agent problem) has been used to explain theoretically accounting choices, voluntary disclosure, voluntary appointment of auditors, and corporate lobbying about proposed accounting standards.² Signalling theory, originally developed to explain problems of information asymmetry in labour markets,³ has been applied to questions of corporate dividend policy,⁴ capital structure decisions,⁵ voluntary disclosure,⁶ managerial retention of ownership in new share issues,⁷ current value accounting,⁸ and voluntary selection of auditors.⁹ The literature of agency theory has tended to pay little attention to signalling, and signalling papers ignore agency theory. Yet both theories are used to address similar accounting issues. Consequently, an initial tempta-

tion is to consider the theories as competing systems.

This article examines the logical relationship between signalling and agency theories. Far from finding them competing, the conclusion of the article will be that the two theories are consistent: that is, if one theory is 'correct' the other theory may also be 'correct'. This opens up the possibility of joining the two theories to provide fresh insights into the principal-agent problem, and into firms' accounting policy choices.

Agency theory is described briefly in the first section, while an outline of signalling theory appears in the second section. The third section covers the steps involved in examining the relationship between two theories, and these steps are applied to agency and signalling theories in the fourth section. Some accounting applications of the finding that these two theories are consistent appear in the fifth section. Conclusions are given in the last section.

*The comments of Ray Ball and Peter Birrell are gratefully acknowledged.

¹Jensen & Meckling (1976).

²Reviewed in Holthausen and Leftwich (1983), and in Kelly (1983). Another branch of agency theory reviewed in Demski and Kreps (1982) considers the form of optimal contracts between principal and agent. This literature is not considered here.

³Spence (1973, 1974). Other non-accounting applications are in insurance (Rothschild and Stiglitz, 1976) and advertising (Kihlstrom and Riordan, 1984).

⁴Bhattacharya (1979, 1980), Eades (1983), Kalay (1980), Penman (1982a), Miller and Rock (1985), John and Williams (1985).

⁵Ross (1977).

⁶Ross (1979).

⁷Leland and Pyle (1977), Downes and Heinkel (1982).

⁸Forker (1984).

⁹Bar-Yosef and Livnat (1984).

Agency theory

Agency theory is concerned with the principal-agent problem in the separation of ownership and control of a firm (Jensen and Meckling, 1976), between different suppliers of capital (Smith and Warner, 1979), and in the separation of risk bearing, decision making and control functions in firms (Fama and Jensen, 1983). If individuals act self-interestedly, these separations produce conflicts.

Agency theory demonstrates that the precipitators of these conflicts incur agency costs, which they then have an incentive to reduce. The agency costs of equity are, firstly, the decline in a firm's value when shareholders perceive managers as not pursuing the shareholders' interest, especially where managers act inefficiently or do not choose

projects as profitable as shareholders would like, and secondly, the costs of monitoring and bonding managers so that they do pursue the shareholders' interest. An optimum trade off exists between these two sets of agency costs. The first agency costs are a manager's opportunity loss, if not reduced by monitoring and bonding, because his self-interested actions precipitate the costs and shareholders build them into the firm's share price.

On the other hand, the agency costs of debt are borne by the equity holders. These costs include (a) the problems of excessive dividend payments, the issue of senior ranking debt, asset substitution and underinvestment (Smith and Warner, 1979), together with bankruptcy and reorganisation costs, and (b) the costs of monitoring and bonding. Rational debtholders incorporate the likelihood of these agency costs in the price they pay for the debt. Again, an optimum trade off exists between monitoring and bonding costs and other agency costs of debt. The agency costs in (a) are opportunity costs to the manager and equity holders if no action is taken to reduce them by monitoring and bonding.

Monitoring and bonding devices include the production of accounting reports, writing restrictive covenants in debt contracts, and management bonus plans geared to reported profits.

There are two versions of agency theory. In Jensen and Meckling (1976), an optimum amount of monitoring and bonding is reached beyond which the reduction of each dollar of perquisite consumption costs more than the benefit gained. Consequently, residual agency costs remain. A similar optimum occurs with the agency costs of debt. Extensions of the theory by Fama and Jensen (1983) and Jensen (1983) leave this fundamental result unchanged.

In a second version of agency theory (Fama, 1980), agency costs are driven to zero by market forces within and external to the firm. A form of full ex post settling up occurs which penalises managers who deviate from maximising shareholders' wealth. Thus, they are motivated to act in the interests of shareholders. In essence, Fama's version of agency theory is a long run version of Jensen and Meckling's. For this reason, Jensen and Meckling's version of the theory will be concentrated on here.

Signalling theory

Signalling theory addresses problems of information asymmetry in markets. The theory shows how this asymmetry can be reduced by the party with more information signalling it to others. Although the theory was developed in the labour market, signalling is a general phenomenon applicable in any market with information asymmetry.

In most signalling models, the following steps

occur. Initially, sellers in a market are assumed to possess more information about their product than buyers. If buyers have no information about specific products but do have some general perceptions (e.g. that $p\%$ of products offered will be faulty and that bad products should sell at $\$x$ and good products at $\$y > \x), then buyers will value all products at the same price which is a weighted average of their general perceptions.

Sellers of above average quality products incur an opportunity loss because their products could sell at a higher price if buyers knew about the superior quality, while sellers of below average products make an opportunity gain. Sellers of high quality products have an incentive to leave the market—the phenomenon of adverse selection (Akerlof, 1970)—unless they can communicate their product's superior quality to buyers and thus increase its price. This communication is done by signalling: the publication of a device (e.g., a product warranty) which acts as a prediction of superior quality. To be effective, the signal must not be easily copied by poor quality sellers. To ensure this, the assumption usually made is that signalling costs are inversely related to quality. Also, the signal must be confirmable with actual product quality observed after purchase.

As better quality sellers signal, buyers consider all the remaining sellers to be of poor quality. Their average price will be reassessed downwards accordingly. The best remaining sellers then try to screen themselves from the others—an iterative process which continues as long as the increase in price obtained exceeds the signalling costs.

The relationship between two theories

The relationship between theories¹⁰ can be assessed in two alternative ways—by examining their underlying axioms and concepts, or by comparing their predictions.

Axiomatic

If two theories deal with the same subject at the same level of reduction,¹¹ under the axiomatic

¹⁰A theory is a model or system consisting of (a) non-contradictory, primitive assertions or axioms; (b) definitions of basic concepts; and (c) the conclusions or predictions which are deduced from them. A theory's axioms and definitions are its sufficient conditions (of which there may be several sets)—in their presence the theory's conclusions follow. Necessary conditions, if any, will be part of each set of sufficient conditions. Necessary conditions are axioms which, if negated, mean that the theory's conclusions can never hold.

¹¹The level of reduction refers to the level at which a problem is addressed by different disciplines. For example, alcohol addiction is examined as a physiological disorder by physicians, as a behavioural disorder by psychologists, and as a social problem by sociologists. There also can be different levels of reduction within one discipline, such as the classical distinction between micro and macro economics.

approach their relationship is fourfold. Firstly, the theories may be equivalent: the same theory under different guises. Secondly, one theory may imply the other: that is, one is a subset of the other. Thirdly, the two theories may be consistent. This means that if one is true the other is *possibly* true. Fourthly, they may be contradictory or competing explanations of the subject: if one is true, the other is false.

Two steps are needed to investigate which of these four relationships applies to two theories A and B. Firstly, whether or not either theory's axioms are necessary conditions must be identified. To establish the equivalence of theories A and B, both theories' necessary conditions must be identical. Similarly, for theory A to imply theory B, the necessary conditions of B must be the same as those of A, or at least a subset of them. If these stipulations are not met, it is logically possible for theory A to hold in the absence of theory B, a denial of equivalence and implication. On the other hand, consistency of theories A and B only requires that their necessary conditions do not conflict. By contrast, if the two theories are competing, their necessary conditions must conflict in at least one particular.

Secondly, each theory's sets of sufficient conditions must be examined. For equivalence, at least one set of sufficient conditions for A must be identical to at least one set of sufficient conditions of B. For theory A to imply theory B, at least one set of sufficient conditions of B must be entailed in part—but not all—of one set of sufficient conditions of A. Consistency of the two theories only requires that the sets of sufficient conditions of A do not conflict with those of B. However, if A and B are competing theories, at least one set of sufficient conditions for each will be contradictory.

These two steps are illustrated in Figure 1 which

depicts, in the upper half, a series of non-contradictory axioms a, b, \dots, k ; and in the lower half a set of axioms $\bar{a}, \bar{b}, \dots, \bar{k}$ which contradict a, b, \dots, k (\bar{a} contradicts a , \bar{b} contradicts b , and so on). Theories I–V are shown as shapes embracing subsets of these axioms. Axioms a, b, \dots, e are sufficient conditions for theory I, axioms e, f, g, \dots, k , are sufficient conditions for theory II and so on. Necessary conditions appear as shaded axioms. Theory II implies theories III and IV,¹² while theories I and II are consistent, as are theories I, III and IV. On the other hand, theory V contradicts each of the other theories.

Prediction

The alternative approach to assessing the relationship between two theories (dealing with the same subject at the same level of reduction) is to compare their predictions or consequences. If these conflict, the theories compete; if they are consistent, so are the theories. (The four way classification of the axiomatic approach is replaced by two categories: competing and consistent.)

As a means of assessing the relationship between signalling and agency theories, prediction comparison is rejected for two reasons. Firstly, comparison of predictions is not reliable if the theories' axioms conflict, because it is possible for the theories' predictions to conflict in one application and to be consistent in another. For example, the Ptolemaic and Newtonian systems of astronomy—competing theories axiomatically—yield the same predictions about planetary motion (and thus in this application are consistent theories) but give conflicting predictions about other astronomical phenomena.

Secondly, in examining the predictions of two theories, the assumption is that the theories' constructs are fully operationalised. At present, this is not so with signalling and agency theories. For example, in agency theory, leverage is used as a proxy for closeness to accounting-based borrowing limits, and bonus plans are usually represented in empirical studies by a dichotomous variable. In signalling theory, quality could be measured using next year's change in reported earnings or share market abnormal performance. However, all of these proxies are imperfect:¹³ they measure the

¹²In some investigations of the relationship between two theories, the approach adopted is to demonstrate that the two theories are special cases of a general or meta theory. The general theory implies the special case theories. In Figure 1, this is exemplified by theories II, III and IV. Yetton and Crouch (1983) provide an example of this approach in the leadership literature.

¹³Ball and Foster (1982) outline the weaknesses of proxy measures in agency theory. Abnormal share price performance and net profit changes next year are imperfect proxies of quality because, although they capture quality changes expected now by managers but known to investors later, they also capture the effects of unforeseen events arising in the ensuing year.

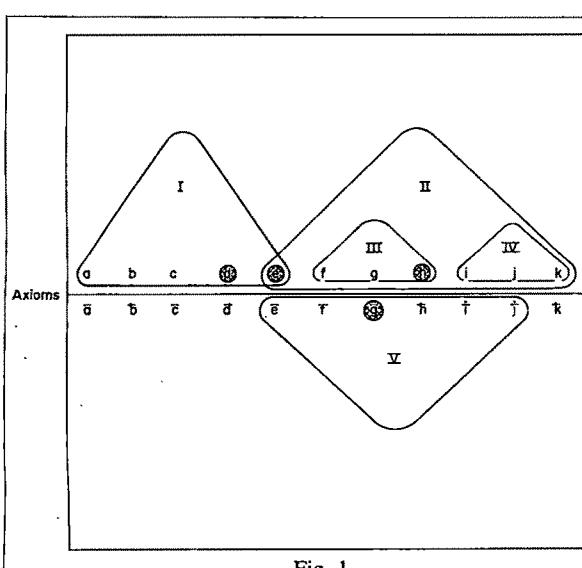


Fig. 1

underlying theoretical construct with error. A difficulty created is that predictions using imperfect proxies may compete (or be consistent) due to this measurement error, leaving unclear whether the underlying theories compete or not.

The remainder of the paper concentrates on assessing the relationship between agency and signalling theories using the axiomatic approach.

The relationship between agency theory and signalling theory

In the first section an outline of agency theory was given. The following assumptions constitute a set of sufficient conditions from which the features of that theory can be derived.¹⁴

- (1) All market participants are rational wealth maximisers.
- (2) All firms operate in two periods.¹⁵ Managers make production/investment decisions in the first period which affect firms' expected values and variances in the second period.
- (3) Firms have external equity and debt financing.
- (4) There is separation of equity and debt capital suppliers and managerial control in the firm.
- (5) Each manager owns a fraction¹⁶ of his firm's outstanding equity.
- (6) Each manager is remunerated by salary, perquisite consumption, and returns on his equity in the firm.
- (7) Monitoring and bonding are available at a cost proportional to the value of the firm; and they reduce activities dysfunctional to capital suppliers at a reducing rate.

In the second section an outline of signalling theory was given. From it, the following set of sufficient conditions for signalling in a capital market setting may be drawn.

- (a) All market participants are rational wealth maximisers.¹⁷
- (b) All firms operate in two periods. Managers

¹⁴For brevity, definitions of basic terms such as monitoring and bonding are omitted.

¹⁵These may be thought of as the present for period one, and the future for period two.

¹⁶In Jensen and Meckling (1976) this fraction commences at 100 percent and is reduced as the manager sells part of his equity to outsiders.

¹⁷Some might object that this assumption is at variance with other applications of signalling theory in capital markets (e.g., Ross, 1977; Bhattacharya, 1980; Kalay, 1980; Talmor, 1981) which assume that managers act in the interests of investors. However, that assumption is not crucial, and is usually made for convenience. The original exposition of signalling theory by Spence (1973, 1974) had market participants acting in their own interests, as did later applications of the theory by Rothschild & Stiglitz (1976), Leland and Pyle (1977), Bhattacharya (1979), Haugen & Senbet (1979), Downs & Heinkel (1982), Heinkel (1982), and Eades (1983).

make production/investment decisions in the first period which affect the quality of firms in the second period.

- (c) The quality of firms competing for equity and debt funds in the capital market varies.
- (d) The actual quality of firms is objectively observable, *ex post*, in period 2.
- (e) Ex ante, in period 1, information asymmetry exists between the manager of each firm and capital suppliers. The manager's information about the firm is superior to that of capital suppliers.
- (f) Signalling costs are inversely related to quality.

The relationship between each theory's assumptions will now be discussed.

Necessary Conditions

Individual rational wealth maximisation (assumption 1) and separation of resource ownership and control (assumption 4) are necessary conditions of agency theory. Together, they imply conflicts of interest between managers of firms and capital suppliers. Without them, the principal-agent problem would not exist. Similarly, information asymmetry (assumption e) is a necessary condition of signalling theory, because without it the need for signalling does not exist.

Prima facie, these necessary conditions of each theory do not conflict. Positive monitoring costs (assumption 7) and separation of ownership and control (assumption 4) imply information asymmetry between managers, investors and creditors. Thus, information asymmetry is implicitly contained in the sufficient conditions of agency theory given above. However, positive monitoring costs are not a necessary condition of agency theory, because the principal-agent problem can still exist in the (unlikely) case of zero monitoring costs, provided that bonding costs are positive. The latter ensures that residual conflicts remain even if all parties are fully informed.

Therefore, agency and signalling theories do not share common necessary assumptions. Hence, the theories are not equivalent, nor does one imply the other.

Sufficient Conditions

The first four assumptions of both theories, given above, are compatible except that agency theory does not mention the concept of 'quality'. However, because signalling is a general phenomenon applicable in any market with information asymmetry, the meaning of 'quality' can be taken from the market context being considered. Therefore, quality may be defined in terms of a firm's expected value, its risk, and the level of the manager's compensation: three variables directly addressed by assumptions (2) and (6) of agency

theory.¹⁸ The manipulation of these variables can produce agency costs. Thus, an above average quality firm will have a higher expected value than firms of comparable risk and levels of management compensation.

Information asymmetry (assumption e) of signalling theory is implied by positive monitoring costs (assumption 7) and the separation of ownership and control of capital (assumption 4) in agency theory, as stated previously.¹⁹ This information asymmetry leads to costs in the form of opportunities foregone by the manager of an above average firm for raising equity or debt capital. Less will be paid for the firm's equity or debt securities than would be the case with no information asymmetry.²⁰ As losses from foregone opportunities, these costs are identical to agency costs of equity or debt. In short, the costs of information asymmetry are a subset of the construct agency costs. As with other agency costs, these costs of information asymmetry are borne by the manager of an above average firm. Graphical proofs of this appear in the Appendix. The manager then has an incentive to signal his firm's above average quality to reduce this opportunity loss.

However, if the firm is below average, the agency costs of information asymmetry are borne by investors since, in the absence of signalling, the market regards the firm as average quality. This conclusion alters a central result of agency theory: that agency costs are always born by the agent. With information asymmetry, some agency costs of below average firms are borne by investors.²¹

For signalling and agency theories to be consistent, signalling costs (assumption f) must be borne by the agent so that he has an incentive to signal truthfully. Also, these signals should not be inconsistent with monitoring and bonding devices (assumption 7) in agency theory. That these conditions hold can be illustrated by reference to three common bonding devices in agency theory.

(1) Management compensation plans are bonding devices because they align the interests of

the manager and the shareholder (Jensen and Meckling, 1976). Many formal management compensation plans specify some threshold profit level below which no bonus is paid to managers (Healy, 1985). This threshold will be negotiated by each manager and his shareholders. At the point of negotiation, the threshold acts as a prediction of attainable future earnings since the manager acting in his own interest will want as much bonus as possible. Better quality managers may negotiate a higher threshold to discriminate themselves from poorer quality managers. If a manager believes his firm to have a higher than average expected value, he will negotiate a compensation package, which, for example, contractually sets the maximum bonus to be paid if the expected value is attained. Also, to reduce the resulting horizon problem in which projects with high short term payoffs but not necessarily high net present values are chosen, above average firms will gear the bonus to some measure which takes account of all expected cash flows, e.g. share price or average earnings. So, bonus schemes can act as a signal.

(2) Contractual debt covenants restricting the amount of debt a firm can raise limit wealth transfers between equityholders and debtholders. Managers have an incentive to offer these protective debt covenants to increase the price at which debt is sold, and indirectly to act as a signal about expected future earnings and expected levels of management compensation. Ross (1977) shows that where managerial compensation contracts are in the form of a contingent contract and where opportunities for wealth transfers to the equityholders are absent (or perfectly controlled), the contractual level of debt issued signals the expected value of the firm. Firms with higher contractual debt equity ratios have above average expected values. Maximum contractual debt equity ratios can also signal limits to a manager's inefficiency (perquisite consumption) because his inefficiency will adversely affect shareholder's equity on the balance sheet (e.g., by reducing reported earnings) and raise the debt equity ratio towards its limit. So, contractual debt equity ratios can act as signals as well as bonding devices.

(3) Dividend constraints are bonding devices because they restrict the manager's ability to transfer wealth to the equityholders. A manager's incentive thus to pay dividends is positively related to his firm's leverage ratio (Kalay, 1978). Since the manager (and the equityholders) bear the resultant agency costs, he will attempt to reduce these by offering protective debt covenants, such as the dividend constraint. Other things being equal, the greater the agency costs of debt, the tighter such a constraint will be. However, a tight constraint increases the chance of forced investment in negative net present value projects, since the dividend constraint may forbid distribution of surplus funds

¹⁸Quality may also be defined in terms of other variables such as turnover, plant efficiency etc. However, it is sufficient for the purpose of examining if agency and signalling theories are consistent to show that 'quality' can be interpreted in terms of agency theory variables.

¹⁹Jensen & Meckling (1976) ignore information asymmetry, claiming that it will not affect their theory in large equity markets and where estimates are rational and errors are independent across firms (p. 318). However, because of the incentive for adverse selection to operate where information asymmetry is present, measurement errors will not be independent across firms (Ronen, 1979).

²⁰Barnea, Haugen and Senbet (1981) and Weston (1981) also suggest that information asymmetry produces these costs.

²¹This observation was first made by Ronen (1979). However, he did not draw out the difference in who bears agency costs between above and below average firms.

to shareholders. This is an overinvestment problem.

Firms with high growth potential, that is a large number of positive net present value projects available, will find this overinvestment problem less costly than other firms and so will tend to offer tighter dividend constraints to debtholders. In this way, a tight dividend constraint can act as a signal about the expected value of the firm.

Signalling Costs

Each of these three bonding devices has a signalling cost function entailing opportunity costs. The manager incurs no penalty if he does not deviate adversely from the contractual levels set by the three devices. (There are also direct contract negotiation costs contained explicitly in agency theory.) If adverse deviation from contract does occur, the manager is penalised the more he deviates. These penalties include a decline in his 'price' in the market for managers and wealth opportunities foregone for the firm and for the manager due to his lack of diligence.

Fama (1980) explicitly models these penalties in his version of agency theory as the process of full ex post settling up. However, Jensen and Meckling (1976) are silent about these penalties. Nevertheless, their version of agency theory is not inconsistent with the existence of such penalties. Indeed, Jensen and Meckling discuss the role of factors other than direct monitoring and bonding outlays (p. 328) in controlling the behaviour of managers, but do not include them in their model.

Conclusion

Since the sufficient conditions outlined for signalling theory are at least consistent with those of agency theory, it can be concluded that the two theories are consistent. Indeed, a considerable amount of overlap exists between the theories because several of the sufficient conditions for signalling are implicit in agency theory. However, because information asymmetry, a necessary condition of signalling theory, is not a necessary condition of agency theory, signalling theory is not implied by agency theory; nor are they equivalent theories.

Applications

From the previous section, it is clear that some constructs of agency theory—bonus plans, contractual debt limits, and dividend constraints—can also act as signals. An implication for accounting research is that proxy variables used to measure these constructs may capture both their agency theory and signalling aspects. Results of empirical studies using these variables must be carefully interpreted as a result.

Given the consistency of signalling and agency

theories, it is conceivably possible to combine them to yield predictions about accounting choices not obtainable from either theory alone.²² However, the problems of operationalising both theories, mentioned earlier, make this a difficult task. At present, the prediction of accounting choices can at least be improved by adding together the predictions from each theory. (This is possible logically given the consistency of the theories.)²³ Some examples follow.

Corporate Lobbying

Existing studies²⁴ of corporate lobbying about proposed accounting standards have used agency theory to predict the decision to lobby and lobbying position. Larger firms tend to lobby. There is also some evidence that the decision to lobby is associated with leverage and the use of management bonus schemes. Larger firms oppose accounting standards which increase reported earnings, while firms with accounting based debt or management compensation contracts favour such standards. The opposite applies to proposed standards which reduce reported earnings.

Generally accepted accounting principles set a lower bound on the fineness of disclosed accounting information. They also contain a degree of flexibility which is often criticised in the accounting literature. Rational investors and creditors will expect management to use this flexibility in reporting the firm's performance in the most favourable way. Therefore, a tendency exists here for adverse selection to operate. To counteract this tendency, high quality firms will wish to signal that they are not using this flexibility to mislead shareholders, or that they are not doing so as much as other firms. One way of doing this is for such firms to be seen as users of the 'best' accounting policies advocated by the accounting profession, provided that these policies do not allow low quality firms to masquerade as high quality ones. Therefore, it is in the interest of high quality firms that accounting principles allow them to reveal that they are in fact high quality.

To ensure that accounting standards of this kind are introduced, high quality firms will lobby the accounting profession. So too will poorer quality firms, in whose interest it is that accounting standards do not provide fine information signals. So both types of firm have an incentive to lobby.

²²Such a 'meta-theory' could also contain new concepts not included in either signalling or agency theories.

²³For example, Puro (1984) argues that agency theory and the economic theory of regulation are consistent, and takes together the predictions from these theories to explain audit firms' lobbying practices.

²⁴These studies have investigated corporate lobbying about general price level accounting (Watts & Zimmerman, 1978), foreign currency translation (Griffin, 1982, 1983; Kelly, 1982) and interest capitalisation (Dhaliwal, 1982).

Lobbying itself is not a signal, mainly because there seem to be no penalties for making a misleading lobbying submission.

For both high and low quality firms, the benefits from lobbying should be higher the greater the information asymmetry between the firm and its investors. This will occur in firms with large numbers of shareholders or geographically widespread shareholdings.

Accounting Policy Choice

In several studies,²⁵ accounting policy choices were related to size and debt covenants, and to a lesser extent to management compensation schemes. As with lobbying, larger firms favour accounting policies which reduce reported earnings, while firms with debt covenants and management compensation schemes based on reported earnings favour income increasing accounting policies, *ceteris paribus*. The contribution of signalling theory is the prediction that higher quality firms will choose accounting policies which allow their superior quality to be revealed, while lower quality firms will choose accounting methods which attempt to hide their poor quality. For example, a higher quality firm may voluntarily adopt segment reporting to disclose the superior risk/return profile of its operations, but a low quality firm would not. Similarly a high quality firm may voluntarily disclose an earnings forecast, but a low quality firm would not. As in lobbying, the incentive to signal by accounting policy selection should be highest where information asymmetry is greatest: in firms with large and widespread numbers of shareholders. Nevertheless, the number of accounting policies which act as valid signals may be limited, given the present flexibility of generally accepted accounting principles.

Voluntary Auditor Selection

Chow (1982) demonstrated how leverage, accounting based debt covenants and firm size were related positively to voluntary auditor appointments by US companies when such appointments were unregulated. Signalling theory's prediction is that auditors will be appointed voluntarily by higher quality firms in order to discriminate themselves from other firms in the market. Again, this incentive should be greatest in firms with large and widespread numbers of shareholders. Further aspects of signalling and auditing are discussed in Bar-Yosef and Livnat (1984).

Summary and conclusions

Any two theories at the same level of reduction may be either equivalent, consistent or competing

accounts, or one theory may be a subset of the other. Agency theory and signalling theory are not equivalent, nor does one theory imply the other, because they do not share the same necessary conditions. However, the sufficient conditions of signalling theory given in the fourth section are at least consistent with those of agency theory. Rational behaviour is common to both theories; information asymmetry is implied by positive monitoring costs in agency theory; quality can be defined in terms of agency theory variables; and signalling costs are implicit in some bonding devices of agency theory. Therefore, agency theory and signalling theory are consistent. Indeed, a considerable amount of overlap exists between them.

The fifth section offered examples where both theories' predictions about lobbying, accounting choices, and voluntary auditor selection were added together (logically possible with consistent theories). However, further research is needed to combine signalling and agency theories into a more general 'meta-theory' which might yield insights into the principal-agent problem, and choice of accounting methods, not obtainable from either theory alone.

Appendix

The objective of this appendix is to demonstrate that information asymmetry can lead to agency costs which are borne by the agent in above average firms, and by the principal in below average firms. The graphical device employed has been used previously by Myers (1977), Kalay (1978) and Holthausen (1979) to demonstrate the wealth transfers that can occur between debtholders and equityholders in a firm.

Assumptions

1. Firms operate in two periods, t_0 = the present and t_1 = the future. Figures 2 and 3 show t_1 outcomes in t_0 present values.
2. There is no debt financing.
3. Where no information about specific firms is available, they are treated alike by investors, whose general perceptions are determined by exogenous factors such as their general knowledge about the corporate sector, the state of the economy etc.
4. Risk about the value of firms is depicted as varying t_1 outcomes in different states of the world.
5. All states of the world are equally likely to occur.
6. For convenience, states of the world have been arranged in Figures 2 and 3 so that value schedules are linear.
7. Firms are wholly owned by managers who

²⁵Holthausen and Leftwich (1983) and Kelly (1983) review these studies.

intend to float shares in them to outside investors.

8. Managers maximise their wealth by maximising their expected compensation and the price at which shares are issued.
9. Each manager's compensation is a fixed proportion of the expected value of his firm in t_1 . This compensation has priority of payment over returns to investors.
10. Signalling costs are inversely related to the value of the firm in any state of the world. Signalling costs rank after management compensation in priority for payment.
11. All firms have accepted projects with net present values of at least zero in all states of the world.

These assumptions differ slightly from those in the body of the paper in order to streamline the exposition which follows.

Figure 2 shows \bar{V} , the value of all firms where no signalling or monitoring is permitted. Investors perceive all firms as having the same expected value $E(\bar{V})$ and risk. Managers' compensation is negotiated as $\alpha E(\bar{V})$ shown as MBC. Since all states of the world are assumed equally likely to occur, the value of managers' compensation and the value of equity can be depicted as segments OABCD and $B\bar{V}C$ of area $OAVD$, the value of the firm.

Suppose that the manager of one firm, JV_1 , knows that its value exceeds \bar{V} in all states of the world, and is less risky than \bar{V} as shown by the shallower slope of JV_1 . If the manager can communicate this to investors, he will receive a higher price for the shares when they are floated, and his compensation will increase to $\alpha E(V_1)$ shown by M_1EF in Figure 2. Signalling will convey this information to investors but at a cost given by GH . The cost schedule is negatively sloped reflecting the assumption that signalling costs are inversely related to value.

By signalling, the manager's compensation is OM_1FD and he receives GJV_1H from selling shares in the firm. If he does not signal, the manager receives $OAVD$ in compensation and share sale proceeds, and he incurs an opportunity loss of $AJV_1\bar{V} - M_1GHF$ which is the manager's net gain from signalling. Hence, he has an incentive to signal.

In Figure 3, \bar{V} and MBC are again the value and management compensation schedules for the average firm. Suppose that the manager of firm V_2 knows that its value is less than \bar{V} in most states of the world, and that it is a riskier investment as shown by the steeper slope of OV_2 . If this information were known to investors, the manager of V_2 would only receive EV_2F when issuing the shares and $OEFD$ in compensation. Uninformed, the market would pay $B\bar{V}C$ for the shares, and the manager's compensation would be $OABCD$. Hence, the gain to him from investors not being informed is $OAG - GV_2\bar{V}$. No signalling will occur, and uninformed shareholders bear the loss.

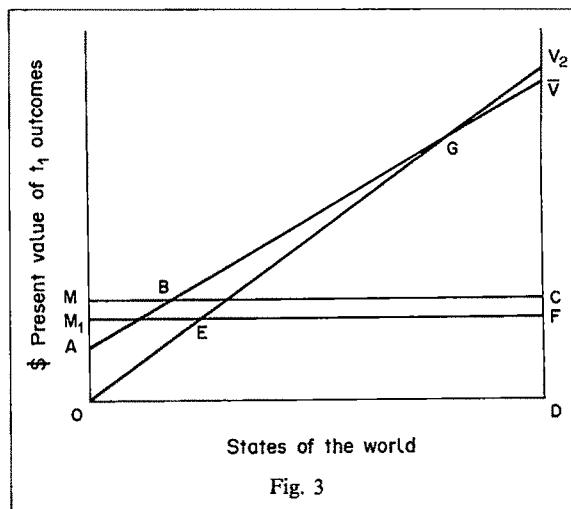


Fig. 3

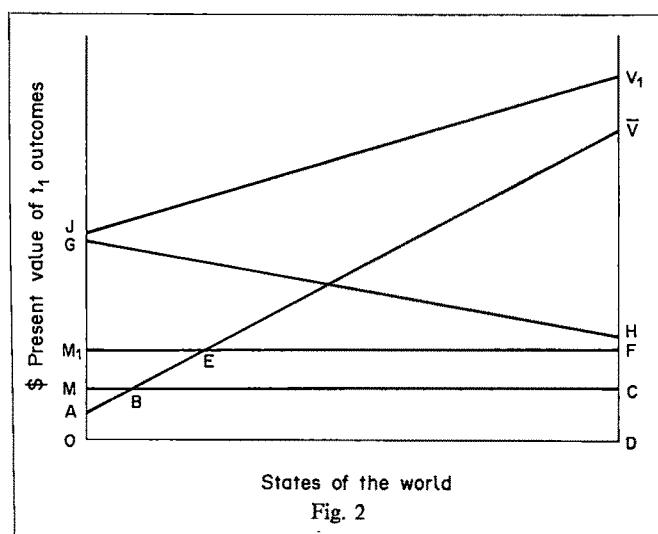


Fig. 2

Similar proofs could be offered for more complex situations, with the same results. The graphical proof also can be adapted easily to show similar effects of information asymmetry where there is debt financing.

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Some Further Empirical Evidence on Predicting Private Company Failure

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Abstract—A common feature of previous work on failure prediction models of UK companies is that the non-failed samples are restricted to include only sound or healthy companies. This may be considered a major weakness since, as a consequence, the models are biased in statistical design and have unclear relevance to a potential user.

The major purpose of this paper is to develop models which explicitly allow for loss-making companies in the non-failed sample. We novelly experiment with multilogit analysis; we also report, as joint products of our analysis, some empirical results on the determinants of the going concern qualification, the time lag in reporting annual accounts and the formal type of legal failure.

Introduction

Most of the previous researchers who have developed failure prediction models in the UK have restricted their non-failed samples to 'sound' or 'healthy' companies or have screened out financially problematical firms (see Taffler, 1984, for a review of these models). For example, the two previous private failure prediction models developed by Tisshaw (1976) and by Taffler (1984) both excluded firms appearing less than 'healthy' from their non-failed samples. This type of *a priori* screening process appears to go somewhat further than merely excluding loss making firms (see Taffler, 1984, p. 211 and footnote 38).

Thus a problem common to the 'traditional' two-group corporate failure analysis is that there appears to be a 'grey area' into which the classification of firms as failed or non-failed is indeterminate.¹ This may be considered to be a particular weakness of two-group estimation techniques, since it might be perceived as being more helpful to the user to classify correctly such 'grey area' companies, rather than firms which more obviously fall into two discrete samples. This may explain, for example, why less than half of the listed manufacturing firms on the 1976 Exstat database which were predicted—by a 1976 Taffler model—as being 'at risk', failed in the following six years (Taffler, 1984, pp. 204-209).

In a previous paper, Peel (1987) developed a

number of logit models with the aim of investigating whether a new variable, the timeliness of reporting annual accounts, enhanced the explanatory power of traditional (two-group) private company failure prediction models.² He discovered that, when a sample of loss making companies was included in his non-failed estimation sample, both the explanatory power and the classification accuracy of his reported models declined significantly. Peel's earlier results may not appear surprising, given that his explanatory variable set included profitability ratios, since previous models of quoted failure prediction (e.g. El Hennawy and Morris, 1983, p. 220) and private failure prediction (Taffler, 1984, p. 203 and p. 219) have indicated that ratios reflecting profitability characteristics are key variables in determining a company's Z-score. Hence, El Hennawy and Morris (1983) concluded: 'Overall it is fairly clear that... the major warning signal appears to be low profitability' (p. 220).

The main purpose of this paper is to extend Peel's earlier analysis to examine the statistical properties and classification accuracy of models developed from failed companies, non-failed profit making (PM) firms and non-failed loss making (LM) companies—where the latter group, *a priori*, is intended to represent companies in the so-called grey area. Apart from estimating binary models for the various categories (e.g. failed/LM, failed/PM), we also experiment with multi-group analysis in

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¹For example, Tisshaw's 1976 private company failure model estimated that 22% of the 2,000 industrial unquoted firms contained in the Jordan Dataquest database in 1976 had Z-scores below his chosen cut-off point—with a further 11% in the 'grey area' (see Taffler, 1984, p. 203).

²The time lag in reporting annual accounts of private firms was found to contribute significantly to the explanatory power and classification accuracy of nine logit models constructed from a variety of financial ratios. The lag variable has also been found to be a significant predictor of corporate failure for quoted companies, in logit models developed from accounting data up to three years before failure (Peel, 1985).

which the various categories are analysed simultaneously. In other words, we attempt in these models to discriminate simultaneously between companies which are healthy, in the grey area (loss making), and failing.

We also investigate whether it is possible to discriminate between failing companies according to failure type, that is, receivership or liquidation. Consideration is also given to the determinants of the timeliness of reporting annual private company accounts, and of auditors' going concern qualifications. The analysis is based on a data set derived from 194 of the larger UK industrial private companies.

In the first section we explain our data sources and methodology. Then we report some of our more interesting empirical results. In the third section we consider the determinants of timeliness of annual accounts, going concern qualifications and failure type. Finally we set out the salient implications of our analysis in a brief conclusion.

Data and methodology

Data

The data set from which the models are estimated comprises 146 private industrial companies (56 failed, 56 non-failed (PM) and 34 non-failed (LM)).

The Extel Unquoted Companies Service, which contains information on about 2,100 of the largest private companies in the UK by reference to turnover, was used to identify the firms employed in this study. The failed firms—that is, firms which were liquidated or entered into receivership—were located following a systematic search of Extel cards, and failed predominantly between 1982 and 1985. Data was derived from the last published annual reports and accounts prior to first public announcement of failure (as indicated in Extel cards).

The 56 non-failed (PM) and 34 non-failed (LM) firms were sampled randomly (on the basis of (\pm) net profit before tax) from the same data source, and had financial year ends falling predominantly in 1984/5.

A holdout sample of 48 private companies (12 failed, 12 non-failed (LM) and 24 non-failed (PM)) was obtained randomly from the same data source to provide some evaluation of the out-of-sample classification power of the models. The data for the holdout sample covers a similar time period, by reference to account year ends and date of failure, as data employed in the estimation samples. We recognise that a stronger test of predictive content would be to see if the model can classify accurately a sample of subsequent events and hope to pursue this in future work. As in our previous work, no attempt was made to match the firms by financial

year end, size or industry. Previous studies have suggested that the appropriate criteria to be used are not obvious (e.g. Ohlson, 1980; Altman, 1983). A superior methodology would appear to be to use variables as predictors rather than for matching purposes. Thus, in this study, size and industry are employed as potential explanatory variables.

Methodology

The main statistical technique used in this paper is *logit analysis*, which is statistically robust under general assumptions concerning the distribution of the independent variables (e.g. Maddala, 1983). *Multilogit* analysis (Maddala, 1983), the generalisation of logit analysis, is the major technique employed for our three-group analysis, but a three-group *discriminant model* (e.g. Lachenbruch, 1975; Maddala, 1983) is also estimated for comparative purposes. No attempt is made in this work to adjust for prior probabilities based on the overall population frequencies of companies falling in the various groups (e.g. Palepu, 1986) and we recognise the possible bias in our results which could result from this. We hope to examine this issue in detail in future work, but would note the difficulties, both conceptual and practical, involved in ascertaining these population parameters.

Since the aim in this paper is to compare the relative performance of different models, and not to provide a 'best' user's model, a 0.5 cut-off point is used to classify firms in the logit analysis. With the multi-group analysis a company is classified to the group with the highest predicted probability.

Results

Summary statistics for the samples of the 56 failed and the 34 non-failed (LM) firms are shown in Table 1. The statistics use *reported* net profit (loss) before tax—deflated by GNP price index (1980 = 100)—as the measure of 'real net profit' (as contrasted with real net profit as the term is understood in the accounting literature).

From Table 1, we note that the mean losses sustained by the non-failed (LM) firms were considerably larger than, and significantly different from, the mean losses of the failed companies. It is also interesting to note that 21 (37.5%) of the 56 failed companies were in fact showing a profit in their last accounts before failure. It may be the case, of course, that some of the non-failed (LM) firms will fail in subsequent years³ (particularly as 5 had their last accounts before failure qualified on a going concern basis). However, as we shall see, company size appears to be inversely related to the event of corporate failure. Thus, as the non-failed

³The authors hope to conduct a follow-up survey of the firms contained in the non-failed (LM) samples for further detailed analysis.

Table 1
Real Net Profit (Loss) (£000s)

	34 Non-failed (LM)	56 Failed
Mean	-5043,753	-601,419
Standard deviation	17208,044	3372,969
Range	75230,634	26082,818
Median	-349,592	-46,109
Maximum	-30,344	942,811
Minimum	-75260,978	-25140,007
(Student's <i>t</i> -test for difference between means = 5.15)		

(LM) firms in our sample are on average significantly larger than the failed companies (see Table 2), this may partly explain why, despite sustaining heavier average losses, they appear to be less prone to failure than are smaller loss-making firms (see also Table 4).

Variables

A total of 85 financial variables were computed for use in the analysis, including seven ratios similar to those employed in two previous unlisted models developed in the UK by Tisshaw in 1976 and by Taffler in 1982⁴ (both reported in Taffler, 1984). The variables which appeared to have the greatest explanatory power in our data set were as follows:

1. SIZE = 1n (total assets divided by Gross National Product price index). The index is based on 1980 = 100. Size has been found to be a highly significant variable in predicting corporate failure in a number of previous studies. (See e.g. Altman, 1983; Ohlson, 1980; Peel, 1985, 1987; Peel *et al.*, 1985, 1986).
2. WCTA = Working capital divided by total assets.
3. QACL = Quick assets divided by current liabilities.
4. NPS = Net profit before tax divided by sales.
5. TLCL = Total liabilities divided by current liabilities.
6. LAG = the time lag in reporting annual accounts. The lag is recorded as the length of time (in units of months) between a company's financial year end and the date of publication of its annual accounts (as reported in Extel cards). This variable has been found to be a significant predictor of corporate failure up to three years before failure for UK quoted companies (see Peel, 1985, Peel *et al.*,

⁴These variables were: earnings before interest and tax divided by average total liabilities, profit before tax divided by sales, net capital employed divided by total liabilities excluding deferred tax, quick assets divided by net capital employed, quick assets divided by current liabilities (Tisshaw, 1976); earnings before interest and tax divided by sales, current liabilities divided by total assets (Taffler, 1984).

al., 1985, 1986), and also for UK private firms in the year preceding failure (Peel, 1987).

The following five variables were successful predictors only in logit models developed from the failed and non-failed (LM) estimation samples.

7. FFCL = flow of funds divided by current liabilities.

8. NWTL = Net worth divided by total liabilities.

9. FFCA = Flow of funds divided by current assets.

10. TACA = Total assets divided by current assets.

11. FFNC = Flow of funds divided by net capital employed.

Finally, the last two variables employed in the analysis—neither of which prove to be significant predictors (with the correct *a priori* sign in the case of the latter variable) in any of our reported models—were as follows:

12. IND = An industry dummy, where a value of one denotes a manufacturing concern, and zero a non-manufacturing concern.⁵

13. AQGC = A dummy 1, 0 variable, where a value of one denotes that the last accounts before failure—or the accounts of the non-failed firms—were qualified on a going concern basis (as indicated in the auditor's report). One (1.8%) of the non-failed (PM), 5 (14.7%) of the non-failed (LM), and 4 (7.1%) of the failed companies in the estimation samples had their accounts qualified on this basis.^{6,7}

In Table 2 we report the mean and standard deviations of the independent variables for each of the three groups in the estimation sample. Employing a Student's *t*-test we note that, as between the failed and non-failed (PM) samples, a number of the variable means are significantly different from each other (WCTA, SIZE, QACL, NPS, LAG). What is particularly interesting, however, is that in each sample, the mean of the lag variable is significantly different from the mean lag in each of the other samples. Furthermore, although the mean size of the failed firms is considerably smaller than, and significantly different from, the mean size of the firms in both the non-failed (PM) and (LM) samples, there is no significant mean difference in

⁵The proportion of manufacturing firms in each of the estimation samples was as follows: failed, 57%; non-failed (LM), 50%; non-failed (PM), 50%.

⁶The frequency of the going concern qualification in the last accounts of the failed private firms (7.1%) is considerably lower than that reported for a sample of failed quoted companies (24.4%) recently examined by Taffler and Tseung (1984).

⁷In addition, two of the non-failed (LM) firms in the hold-out sample had their accounts qualified on this basis.

size between the non-failed (PM) and non-failed (LM) firms.

Thus it appears from our sample of companies that, on average, failing private firms are typified by a longer lag in reported annual accounts than both profit making and loss making non-failed private firms. Non-failed (LM) firms, in turn, display a longer mean time lag in reporting accounts than non-failed (PM) companies. In addition, on average, failed firms are significantly smaller than both profit making and loss making (non-failed) firms—there being no significant difference in mean size between the latter two groups.

Traditional Models

We begin by reporting estimates of the 'traditional' model, that is, based on failed and non-failed (PM) samples (with the binary dependent variable 0 = failed, 1 = non-failed (PM)). Table 3 reports the most successful logit model^{8,9} (denoted FP) developed from these samples, together with misclassification rates in and out-of-sample (employing a 0.5 cut-off point). Although the misclassification rates, both within and out-of-sample, for the failed and non-failed (PM) firms, are reasonable for a model of this type, no less than 75% of the non-failed (LM) firms in the holdout sample were misclassified as Type II errors (that is, non-failed misclassified as failed).

Furthermore, employing the estimated logit coefficients from the FP model to classify the 34

non-failed (LM) firms—which are used in subsequent analysis as an estimation sample—resulted in 27 (79.4%) Type II classification errors. Given the high proportion of non-failed (LM) firms misclassified by the FP models, a number of logit models (with the binary dependent variable 0 = failed, 1 = non-failed (LM)) were developed from the failed and non-failed (LM) estimation samples with the aim of investigating whether it was possible to differentiate between them on the basis of a two-group analysis. Table 4 reports logit estimates, together with misclassification rates, of the most successful logit model (denoted FL). In terms of within-sample classification accuracy (78.9% correct), model FP appears to perform reasonably well. However the holdout results reveal that, as between the failed and loss-making firms, the overall correct classification of these firms amounts to only 58.3% (an identical overall classification as that reported for the holdout classification of these firms for the FP model in Table 3) with seven (58.3%) of the loss-making companies misclassified. Although the models were not developed with a view to classifying non-failed (PM) firms, it is interesting to note that model FL misclassifies a substantial proportion (33.3%) as Type II errors. Overall, the traditional models based on the failed and non-failed (LM and PM) samples illustrate the difficulty of developing models which will effectively discriminate between failed and loss-making firms—at least on the evidence of the samples and variables employed in this study.

A Multilogit Model Approach

So far we have shown that a 'traditional' logit failure prediction model (based on failed and non-failed (PM) firms) cannot effectively distinguish between failed and non-failed (LM) companies out-of-sample. The difficulty in discriminating between these two groups was also evident from the logit model specifically developed from the failed and non-failed (LM) samples.

In the final part of this section we report three models specifically estimated from the three groups of firms contained in the estimation sample. We then discuss their classification performance relative to the other models. The first model (Table 5, denoted FLP) is a logit model derived from the 56 failed companies (dependent variable denoted 0) and the (grouped) 90 non-failed firms (56 profit making and 34 loss making; dependent variable denoted 1).

The polychotomous dependent variable in the multilogit model is 0 (= failed) as alternative (Alt) 0; 1 (= non-failed PM) as alternative 1; and 2 (= non-failed LM) as alternative 2. Our preferred multilogit model (denoted MLM in subsequent tables) was given by:

⁸A logit model developed from the samples and variables reported in Table 3, together with the AQGC and IND dummy independent variables, gave the following values:

$$\begin{aligned} \text{Dependent variable 0 (failed), 1 (non-failed)} \\ &= 1.15 + 0.84 \text{ SIZE} + 30.88 \text{ NPS} + 3.22 \text{ WCTA} \\ &\quad (0.35) \quad (2.50) \quad (2.49) \quad (1.75) \\ &\quad - 5.34 \text{ TLCL} - 0.27 \text{ LAG} - 0.55 \text{ IND} + 2.29 \text{ AQGC} \\ &\quad (2.39) \quad (2.78) \quad (0.73) \quad (1.20) \end{aligned}$$

McFadden's $R^2 = 0.61$ ($N = 112$) (Asymptotic t -values are in parentheses). It will be noted that the estimated coefficients of IND and AQGC are insignificantly different from zero, and the latter also has a sign (+) different from that anticipated.

⁹A discriminant model based on the failed and non-failed (PM) estimation samples was also developed for comparison with the FP logit model. Employing the SPSSX (1983) statistical package, and using the step-wise variable selection procedure which minimised the overall Wilks' lambda, produced a discriminant function which included the following five variables (in order of size of correlation within the function): SIZE (15.1); LAG (10.8); NPS (4.4); net worth divided by total assets (NWTA) (10.3); TLCL (9.4). (F to remove values are in parentheses.) This model had an overall correct classification rate of 83.1% within-sample, and 77.1% out-of-sample. The overall classification accuracy of the discriminant model in the holdout sample was an improvement on the FP logit model (72.9%).

Table 2
Means, Standard Deviations (S.D.) and *t*-Test

Variable	Failed (F)		Non-failed Profits (NFP)		Non-failed Losses (NFL)		T-Values for Difference between Means		
	Sample (56)	S.D.	Sample (56)	S.D.	Sample (34)	S.D.	Samples F and NFP	Samples F and NFL	Samples NFL and NFP
WCTA	0.055	0.228	0.210	0.197	0.071	0.370	3.84*	0.25†	2.32*
SIZE	7.637	1.332	9.127	1.498	8.936	1.788	5.56*	3.93*	0.55†
QACL	0.708	0.641	0.989	0.649	1.039	1.386	2.30*	1.54†	0.24†
NPS	-0.068	0.229	0.078	0.122	-0.073	0.088	4.19*	0.13†	6.26*
TLCL	1.236	0.589	1.074	0.191	1.313	1.456	1.95†	0.35†	1.22†
LAG	12.953	5.521	8.558	3.244	10.812	3.742	5.14*	2.00*	3.01*
FFCL	-0.002	0.892	0.387	0.377	-0.074	0.176	3.01*	0.47†	6.70*
NWTL	0.656	0.965	1.989	4.708	1.142	2.189	2.07*	1.45†	0.98†
FFCA	-0.166	1.088	0.284	0.422	-0.041	0.296	2.89*	0.65†	3.94*
TACA	1.719	1.417	2.432	6.011	1.577	1.442	0.86†	0.46†	0.81†
FFNC	0.689	2.946	0.385	0.504	0.148	2.751	0.76†	0.87†	0.63†
IND	0.571	0.499	0.500	0.505	0.500	0.508	0.75†	0.65†	0.00†
AQGC	0.071	0.259	0.018	0.134	0.147	0.359	0.55†	1.15†	0.29†

*Significant difference at 5% level.

†Insignificant difference at 5% level.

Table 3
**Model FP—Logit Estimates and Misclassification (Estimation Samples:
56 Failed and 56 Non-failed (Profits))**

Variable	Coefficient	Misclassification (0.5 cut-off point)		
TLCL	-5.49 (2.52)	Within sample		
NPS	31.18 (2.99)	Type I	Type II	Total
SIZE	0.76 (2.47)	56 failed	56 profits	<i>N</i> = 112
WCTA	2.71 (1.58)	8 = 14.3%	5 = 8.9%	13 = 11.6%
LAG	-0.25 (2.84)	Holdout sample		
CON	1.76 (0.56)	Type I	Type II	Total
		12 failed	12 losses	24 profits
		1 = 8.3%	9 = 75%	3 = 12.5%
				13 = 27.1%

McFadden's¹ $R^2 = 0.60$

¹ $R^2 = 1 - \log \text{likelihood at convergence}/\log \text{likelihood at zero}$ (McFadden, 1973). (Asymptotic *t*-values are in parentheses.)

Alt (0), i.e. failed

$$= 4.52 + 0.10 \text{ LAG} - 0.17 \text{ SIZE} + 0.22 \text{ TLCL} \\ (2.68) \quad (1.68) \quad (3.56) \quad (2.94) \\ + 1.95 \text{ NPS} + 2.28 \text{ WCTA} - 2.58 \text{ QACL} \\ (1.41) \quad (2.94) \quad (3.02)$$

Alt (1), i.e. non-failed profit making

$$= 6.0 - 0.23 \text{ LAG} + 0.09 \text{ SIZE} - 3.27 \text{ TLCL} \\ (2.1) \quad (2.33) \quad (0.36) \quad (1.77) \\ + 54.23 \text{ NPS} + 2.68 \text{ WCTA} - 1.35 \text{ QACL} \\ (4.62) \quad (1.34) \quad (1.61)$$

t-values in parentheses. McFadden's $R^2 = 0.48$.¹⁰

The estimated multilogit model suggests that, at least in sample, significant discrimination between the three categories is possible, since a number of variables are significantly different from zero in the individual categories.

¹⁰The coefficient and *t*-values (in parentheses) for AQGC and IND, when added to our preferred multilogit model, were:

$$\text{Alt (0) failed} = 1.84 \text{ AQGC} + 0.005 \text{ IND} \\ (2.01) \quad (0.11)$$

$$\text{Alt (1) non-failed (PM)} = 0.84 \text{ AQGC} + 0.23 \text{ IND} \\ (0.44) \quad (0.44)$$

Table 4
**Model FL—Logit Estimates and Misclassification (Estimation Samples:
56 Failed and 34 Non-failed (Losses))**

Variable	Coefficient	Misclassification (0.5 cut-off point)		
TLCL	-2.29 (2.98)	Within sample		
SIZE	0.72 (3.44)	Type I	Type II	Total
WCTA	-2.78 (2.11)	56 failed	34 losses	$N = 90$
LAG	-0.12 (1.95)	$4 = 7.1\%$	$15 = 44.1\%$	$19 = 21.1\%$
QACL	2.66 (2.98)	Holdout sample		
FFNC	-0.32 (2.24)	Type I	Type II	Total
CON	-4.01 (2.28)	12 failed	12 losses	24 profits
		3 = 25%	7 = 58.3%	8 = 33.3%
				18 = 37.5%
McFadden's ¹ $R^2 = 0.28$				

¹See Note 1, Table 3. (Asymptotic t -values are in parentheses.)

Table 5
**Model FLP—Logit Estimates and Misclassification (Estimation Samples: 56
Failed and 90 Non-failed (56 Profits; 34 Losses))**

Variable	Coefficient	Misclassification (0.5 cut-off point)		
TLCL	-0.15 (3.00)	Within sample		
NPS	3.38 (1.44)	Type I	Type II	Total
SIZE	0.78 (4.16)	56 failed	34 losses	56 profits $N = 146$
WCTA	-1.51 (1.35)	$20 = 35.7\%$	$10 = 29.4\%$	$4 = 7.1\%$ $34 = 23.3\%$
LAG	-0.15 (3.01)	Holdout sample		
QACL	2.47 (3.18)	Type I	Type II	Total
CON	-3.23 (2.13)	12 failed	12 losses	24 profits
		6 = 50.0%	4 = 33.3%	2 = 8.3%
				12 = 25.0%
McFadden's ¹ $R^2 = 0.33$				

¹See Note 1, Table 3. (Asymptotic t -values are in parentheses.)

Table 6
Classification Results (Within-Sample): MLM (Multilogit Model) and MDM (Multidiscriminant Model)
Actual Group *N* *Predicted Group Membership**†

	<i>N</i>	<i>Predicted Group Membership</i> *†					
		0		1		2	
		MLM	MDM	MLM	MDM	MLM	MDM
Group 0 = failed	56	46 (82.1%)	41 (73.2%)	8 (14.3%)	7 (12.5%)	2 (3.6%)	8 (14.3%)
Group 1 = non-failed (profits)	56	4 (7.1%)	8 (14.3%)	51 (91.1%)	42 (75.0%)	1 (1.8%)	6 (10.7%)
Group 2 = non-failed (losses)	34	17 (50.0%)	9 (26.5%)	0 (0.0%)	8 (23.5%)	17 (50.0%)	17 (50.0%)

*Percent of three groups correctly classified: MLM = 78.1%; MDM = 68.5%.

†Percent of two groups (failed and non-failed) correctly classified: MLM = 78.8%; MDM = 78.1%.

Table 7

Classification Results (Holdout Sample): MLM (Multilogit Model) and MDM (Multidiscriminant Model)

Actual Group

N

Predicted Group Membership†*

	12	0		1		2	
		MLM	MDM	MLM	MDM	MLM	MDM
Group 0 = Failed	12	8 (66.6%)	8 (66.6%)	2 (16.7%)	0 (0.0%)	2 (16.7%)	4 (33.3%)
Group 1 = non-failed (profits)	24	2 (8.3%)	2 (8.3%)	19 (79.2%)	19 (79.2%)	3 (12.5%)	3 (12.5%)
Group 2 = non-failed (losses)	12	7 (58.3%)	6 (50.0%)	0 (0.0%)	3 (25.0%)	5 (41.7%)	3 (25.0%)

*Percent of three groups correctly classified: MLM = 66.7%; MDM = 62.5%.

†Percent of two groups (failed and non-failed) correctly classified: MLM = 72.9%; MDM = 75.0%.

Finally, employing the SPSSX (1983) statistical package, a three-group multidiscriminant model (denoted MDM in subsequent tables) was developed using the same independent variables as were used in the MLM model. These variables proved to be at least as successful as any discriminant functions based on variables selected on the basis of the various step-wise variable selection procedures available on the SPSSX statistical package.^{11,12}

Having described the models, we now move on to analyse their comparative classification accuracy within and out-of-sample. Table 6 shows the within-sample three-group classification accuracy of the MDM and MLM models. In terms of overall classification accuracy, the MLM model (78.1%) outperforms the MDM model (68.5%). What is particularly interesting, however, is that out-of-sample (Table 7) the overall three-group classification accuracy of the two models remains reasonably robust (MLM = 66.7%; MDM = 62.5%). However, Tables 5 and 7 show that on a Type I, Type II error basis, the FLP logit model (employing a 0.5 cut-off point) and the MDM

model have the highest overall out-of-sample two-group classification accuracy (75.0%). (This compares with 72.9% each, for the FP and MLM models.) Thus, although the classification results of the multi-group models are encouraging, their incremental information content to the user, on the basis of these results, may be considered to be marginal only.

The actual predicted values¹³ of the firms in the holdout samples derived from the FL, FP, FLP (Tables 3-5), MDA and MLM models (Table 6), illustrate the difficulties that a user might face when using any of the models in combination. For example, the traditional FP model may be favoured by the user, since out-of-sample it minimised Type I errors (notwithstanding that it misclassified 9 (75%) of the non-failed (LM) firms). The FLP model, on the other hand, had one of the lowest overall out-of-sample misclassification rates, but made the highest number of Type I errors (50%) (though it performed best of all on the loss making firms in the holdout sample). Furthermore, the MDA and MLM models, which were specifically developed to try and improve on the classification of 'grey area' companies (here represented by non-failed (LM) firms), displayed their greatest number of classification errors amongst this group of firms.¹⁴

¹¹Employing the five step-wise methods of variable selection available on the SPSSX (1983) statistical package—including procedures which minimise the overall Wilks' lambda and which maximises the Mahalanobis distance between groups—produced a discriminant function which included the following six variables: sales divided by total liabilities (STL); net worth divided by total assets (NWTA); flow of funds divided by total assets (FFTA); NPS; SIZE; LAG. Based on F to remove values, the relative importance of the variables (in descending order) to the discriminant functions were as follows: SIZE (8.6); LAG (6.5); NPS (3.7); NWTA (3.3); FFTA (2.5); STL (2.2), (F to remove values are in parentheses). The overall three-group classification accuracy of the model was 69.86% within-sample and 58.33% out-of-sample.

¹²The F to remove values of the independent variables for the reported multidiscriminant model was as follows (F values are in parentheses): SIZE (9.9); NPS (7.8); LAG (6.5); TLCL (4.5); QACL (3.0); WCTA (2.9).

¹³Tables of predicted probabilities are available from the authors on request.

¹⁴The question as to whether the classification accuracy of the models reported in this paper have been biased downward—to the extent that the going concern qualification is considered to equate with 'failure'—by the retention of 8 companies which received going concern qualifications in the non-failed samples (6 within-sample; 2 in the holdout sample) is inconclusive. For example, model FLP misclassified 3 of these firms within-sample (1 out-of-sample). The equivalent figures for the three-group models were MLM, 3(1); MDM, 2(1).

It would appear from these results that, using conventional predictors, more general statistical techniques cannot solve the problem of accurately predicting the fate of the so-called 'grey area' firms. The solution to this problem (if one exists) would seem to require that additional predictors be found.

Timeliness, going concern qualifications and failure type

Timeliness of Annual Accounts

The timeliness of reporting annual company accounts has been found to be a significant predictor of corporate failure in this¹⁵ and in previous studies (see Peel, 1985, 1986; Peel *et al.*, 1985, 1986). The decision to delay publication of accounts may be purely strategic on the part of management (see e.g. Argenti, 1983, p. 68). The reasons may be many and varied (Peel, 1985), and therefore difficult to model. However, if the timeliness lag varies with the 'news content' of the accounts, we may expect to find some correlation between variables reflecting the financial 'condition' of the firm and its timeliness in reporting annual accounts. It seems of some interest, therefore, to investigate—from the range of variables employed in this study—what factors, if any, appear to be important determinants of variations in the lag variable. Employing Ordinary Least Squares (OLS) regressions on the samples of failed/non-failed (PM) and the failed/non-failed (PM, LM) estimation samples revealed that four variables in particular appeared to be significantly correlated with the timeliness of reporting annual private company accounts. They were: SIZE, AQGC (accounts qualified on going concern basis), FFS (flow of funds divided by sales), and NPNC (net profit before tax divided by net capital employed). OLS regressions of these variables on the dependent LAG variable gave:

$$\begin{aligned} \text{LAG} = & 16.14 + 5.35 \text{ AQGC} - 0.61 \text{ SIZE} \\ & (6.80) \quad (2.56) \quad (2.15) \\ & - 6.47 \text{ FFS} - 0.66 \text{ NPNC} \\ & (2.77) \quad (2.77) \end{aligned}$$

$$R^2 = 0.20$$

$N = 112$ (56 failed; 56 non-failed (PM))

(*t*-values are in parentheses).

$$\begin{aligned} \text{LAG} = & 14.09 + 4.28 \text{ AQGC} - 0.39 \text{ SIZE} \\ & (7.12) \quad (2.96) \quad (1.73) \end{aligned}$$

$$\begin{aligned} & - 6.54 \text{ FFS} - 0.40 \text{ NPNC} \\ & (3.10) \quad (2.03) \end{aligned}$$

$$R^2 = 0.14$$

$N = 146$ (56 failed; 90 non-failed (PM, LM)).

(*t*-values are in parentheses).

It would appear therefore that, *ceteris paribus*, a private company which has had its accounts qualified on a going concern basis, which is relatively small in size, with comparatively low ratios of flow of funds to sales and net profit to net capital employed, is more likely to exhibit a longer lag in reporting annual accounts than are private firms without these characteristics (although, as might be anticipated, size diminishes in significance when loss-making companies are included in the estimation sample).

It would appear from these regressions that, although a linear combination of the best fitting financial variables from our data set explains some of the variation of the dependent lag on accounts variable, a large amount (80% and 86% respectively for the two OLS regressions) remains unexplained. The inclusion of other independent variables, outside our data set, such as changes in auditors' remuneration, may improve upon the explanatory power of these regressions. As Ohlson (1980, p. 113) has commented, for firms in 'poor shape' the auditing process might be particularly problematical and time consuming. We are, nonetheless, led to conclude, on the evidence of the models reported in this paper, that the time lag in reporting annual accounts has genuine predictive ability when combined with traditional financial variables, and is not simply acting as a proxy for those variables.

Going Concern Qualifications

Taffer and Tseng (1984), who traced the performance of 56 quoted industrial and distribution companies which received going concern qualifications in 1979 or later, discovered that only 20% subsequently failed. They concluded: 'A going concern qualification paradoxically is associated with the continuance of an enterprise not its failure' (p. 25). Notwithstanding this observation, it still came as a surprise to discover that, in all the models reported in this study, the going concern qualification dummy 1, 0 variable had an estimated coefficient (positive) associated with the non-failure of private firms. For example, a logit model based on the variables and samples used to construct the FLP model (Table 5), together with the AQGC independent variable, gave the

¹⁵The within-sample classification accuracy (employing a 0.5 cut-off point for logit models) of models with the LAG variable as the sole independent variable, was as follows:

(i) Three-group classification models ($N = 146$); multilogit model = 59.03%; multidiscriminant model = 52.05%.

(ii) Two-group classification models ($N = 146$); logit model = 70.55%; discriminant model = 70.55% (sic).

(iii) Two-group classification models ($N = 112$; 56 failed, 56 non-failed (PM)); logit model = 75.0%; discriminant model = 74.11%.

following values (dependent variable, 0 = failed, 1 = non-failed):

$$\begin{aligned}
 &= -3.25 + 1.74 \text{ AQGC} + 2.53 \text{ QACL} \\
 (3.26) &\quad (2.02) \quad (3.13) \\
 \\
 &- 0.74 \text{ WCTA} + 0.81 \text{ Size} + 3.70 \text{ NPS} \\
 (0.60) &\quad (4.23) \quad (1.57) \\
 \\
 &- 2.52 \text{ TLCL} - 0.18 \text{ LAG} \\
 (3.58) &\quad (3.27)
 \end{aligned}$$

McFadden's $R^2 = 0.35$, $N = 146$ (see also footnotes 8 and 10). (Asymptotic t -values are in parentheses.)

Although the AQGC variable has an estimated coefficient significantly different from zero, its sign is positive, and so this result might be considered perverse—given that such qualifications are given on the basis that a company might not ‘continue in operational existence for the foreseeable future’ (SSAP2). Hence, although our empirical findings for private firms appear to fit with Taffler and Tseung’s hypothesis for quoted companies, it is still difficult to find a rationale as to why this should be the case.¹⁶

A number of logit models were developed with the AQGC dummy (1 = qualification; 0 = no qualification) as the dependent variable, with the aim of investigating whether any of the financial ratios computed in this study were significantly correlated with this event. The most successful logit model, employing all the companies in the estimation samples, was as follows:

Dependent variable AQGC

$$\begin{aligned}
 &= -1.45 - 0.86 \text{ NPNC} + 0.05 \text{ NPFF} \\
 (1.49) &\quad (2.16) \quad (1.20) \\
 \\
 &- 1.38 \text{ WCNC} - 0.74 \text{ STL} - 4.04 \text{ NCTL} \\
 (1.93) &\quad (2.57) \quad (2.77) \\
 \\
 &- 0.22 \text{ QANC} \text{ (footnote 17)} \\
 (1.60)
 \end{aligned}$$

McFadden's $R^2 = 0.45$, $N = 146$
(Asymptotic t -values are in parentheses.)

¹⁶It would appear that further research is required to establish the exact grounds upon which the going concern qualification is given for a particular firm. A referee is somewhat less surprised by the result. He points out that to provide a going concern qualification for a company which is really on the rocks is to make, in effect, the momentous decision to push it over the edge. On the other hand if a company is really fairly sound but in a technically insolvent position then the auditor is not in such a difficult position. Clearly there is a need for more work on this issue.

¹⁷The variables are: net profit divided by net capital employed (NPNC); net profit divided by flow of funds (NPFF); working capital divided by net capital employed (WCNC); sales divided by total liabilities (STL); net capital employed divided by total liabilities (NCTL); quick assets divided by net capital employed (QANC).

Failure Type

In most studies the ‘event’ of ‘failure’ is signified by a creditors’ voluntary winding up, receivership, or winding up by court order (in accordance with the 1985 Companies Act, as amended by the 1985 Insolvency Act). The advent of the new administrator procedure in the 1986 Insolvency Act has added a new and interesting category to this list, and will be of great interest in future research (see Peel, 1987). In this study, the 56 private companies in the failed estimation sample were collected with a view to investigating whether there were any perceived differences between private companies which had failed by reason of receivership, and those which had failed by reason of a court or creditor’s winding up.¹⁸

Thus the 56 firms in the failed estimation sample comprise 28 companies where the first announcement of failure was the appointment of a receiver (and where there was no subsequent announcement pertaining to liquidation), and 28 firms where no receiver was appointed, but where a court or creditors winding up constituted the first public announcement of failure.

A number of logit models were developed (with the dependent variable 0 = receiver; 1 = non-receiver) to investigate whether any of the variables computed for use in this study appeared to be correlated with failure type. However, we were unable to find (using two, three, or four-group analysis) any variables which were significantly associated with failure type. A typical logit model was as follows:

Dependent variable 0 (receiver) 1 (non-receiver)

$$\begin{aligned}
 &= -1.45 - 0.59 \text{ IND} - 0.96 \text{ AQGC} \\
 (0.70) &\quad (0.93) \quad (0.72) \\
 \\
 &- 4.54 \text{ NPS} + 1.52 \text{ QACL} + 0.44 \text{ WCTA} \\
 (1.16) &\quad (1.49) \quad (0.25) \\
 \\
 &- 1.55 \text{ TLCL} - 0.04 \text{ LAG} + 0.02 \text{ SIZE} \\
 (1.65) &\quad (0.75) \quad (0.75)
 \end{aligned}$$

McFadden's $R^2 = 0.12$, $N = 56$
(Asymptotic t -values are in parentheses.)

Conclusions

The principal concern of this paper has been to investigate, in much greater detail than has been attempted in previous work, the classification accuracy and explanatory power of private failure predictive models which explicitly include loss making firms in the non-failed sample. As one input into our statistical analysis, we novelly estimated multilogit and multidiscriminant models.

¹⁸Five of the 28 firms in the non-receivers sample were wound up by court order.

Our analysis was only partially successful. The formal classification errors are relatively high in the holdout samples. However, since previous statistical work, which excludes 'problematical' firms, is heavily biased in sample design and of unclear relevance to a potential user, our work does, we believe, represent a promising first step in designing appropriate user models. Future work might usefully broaden the scope of the predictors to include additional non-financial variables.

There were a number of interesting results which emerged as joint products of our analysis. We found that the going concern qualification had a sign which was wrong *a priori* in predicting failure, a result consistent with the hypothesis postulated by Taffler and Tseung (1984) for a sample of quoted companies. However, the going concern qualification was found to be a significant predictor of lag length, with the *a priori* correct positive sign. Clearly, there is an element of simultaneity in these relationships which is deserving of more formal attention in future work.

Finally, we considered the distinction between type of formal (legal) failure, from the perspective of receivership and non-receivership. We were unable to find any variables which discriminated between these categories. It does, however, seem a worthwhile area for future work, particularly given the advent of the new administrator procedure under the 1986 Insolvency Act.

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The Effects of Information and Cognitive Processes on Decision Making

Waymond Rodgers and Thomas J. Housel

Abstract—This article examines the efficacy of a two-stage cognitive model of decision making within the context of loan decisions. A covariance structural analysis of the cognitive processes that loan officers and MBA students used to reach loan decisions was examined through measures designed to test the proposed two-stage processing model. The results indicated that, during the first stage of cognitive processing, conceptually-driven and data-driven perceptual biases caused different assessments of loan information. The results also indicated that judgments made during the second phase of processing significantly affected decision choice. The well documented conservatism bias was also evident in the results. The result was that experienced loan officers did not out-perform novice students on most of the loan decisions. The relative usefulness of the two-stage model is discussed and general suggestions for future decision making research are offered.

Introduction and literature review

The loan-making process provides a useful context for the study of decision making because the parameters of knowledge and standard assumptions are known. Loan officers share very similar educational backgrounds, specifically the kinds of training they receive to qualify as loan officers. The loan process follows a very predictable pattern: (a) application for a loan, (b) credit evaluation, (c) loan review, and (d) repayment performance. If the repayment performance is unsuccessful, charge-off and work-out procedures ensue; if successful, a loan renewal application is often forthcoming (Altman, 1983).

A critical concern for banking and lending institutions in the current environment of large numbers of loan failures is the need to understand and improve the performance of loan officers in the granting of loans. Approaches which focus primarily on conditions external to the loan officers' cognitive processes, for example those studies which employ Brunswik's (1952) lens model, to date have not provided answers to this pressing problem of why loan officers make bad loan decisions (Libby, 1979; Einhorn & Hogarth, 1981; Dillard, 1984; Birnberg and Shields, 1984). Recognising the serious shortcomings of 'input-output' models in studying the decision-making process, Payne, Braunstein, and Carroll (1978) concluded: 'The input-output analyses that have been used in most decision research are not fully adequate to develop and test process models of decision behavior' (p. 19).

The task for decision researchers is to discover the process by which loan officers actually make decisions (i.e. via descriptive models) so that the errors or 'misperceptions' (Libby, 1979, p. 100) can

be corrected by comparison with normative models. Dillard (1984) also pointed out the need for these two lines of research.

Glass and Holyoak (1986) also recognised the value of comparing normative models with descriptive models: 'When an accurate descriptive model violates principles embodied in a corresponding normative model, a shortcoming of human reasoning is pinpointed' (p. 334).

That decision makers, including loan officers, do not always follow normative reasoning procedures to arrive at correct decisions is well documented. If statistically sophisticated Stanford Business School graduate students are consistently prone to violate certain normative decision making rules (Tversky and Kahneman, 1982), then it is likely that even experienced loan officers may also be prone to make similar errors in reasoning. After an extensive review of the decision making research, Glass and Holyoak (1986) concluded: 'in general, we have no reason to believe that descriptive models of deductive reasoning bear any close resemblance to normative models' (p. 338).

Experienced loan officers have the benefit of their prior experiences to call on when making loan decisions. The benefits of this prior experience allow them to make loan decisions relatively quickly without having to attend to all the details of the loan information. It would be very difficult for loan officers to attend to all the loan information available because of normal limitations on attention and short-term memory (Birnberg & Shields, 1984; Casey, 1980a), not to mention the daily working pressures to evaluate numerous loan applications.

It is these specific errors in decision making, in spite of the benefits of loan officers' prior experi-

ence, that must be understood in order to develop corrective measures and reduce the number of bad loans (Libby, 1979; Birnberg and Shields, 1984; Dillard, 1984). As Glass and Holyoak (1986) point out: 'the challenge for the future is to devise means of minimizing the potential errors that can result from heuristic judgments while, at the same time, maintaining their beneficial aspects' (p. 361). An analysis of the cognitive processes that loan officers go through to make loan decisions will provide insight into the influences of their prior experiences and native biases in making decisions.

In outlining the requirements for a theory that would account for the cognitive activities of decision makers, Dillard (1984) indicated the need for studying decision making within a specific domain (i.e. loan making decisions): 'the criterion for evaluating such a theory is how well the general processes explain the observed decision behavior when applied to a specific domain' (p. 344). Neisser (1976, p. 7) also argued for studying cognitive processes within 'real world' contexts:

Cognitive psychologists must make a greater effort to understand cognition as it occurs in the ordinary environment and in the context of natural purposeful activity.

The present study takes the former general decision making research a step further by examining the decision-making process within the domain-specific context of loan making. This study responds to Dillard's and Neisser's imperative by focusing on the context of the naturally occurring purposeful activity of experienced loan officers making loan decisions.

Input-output models

Many decision-making models are based on the assumption that knowledge of the characteristics of stimulus information is sufficient to predict outcome (Payne *et al.*, 1978). These input-output models implicitly assume that:

1. all receivers are alike and share the same throughput mechanisms,
2. the structure and contents of stimulus information predict decision outcome,
3. receivers' mental processes occur automatically,
4. an understanding of cognitive processes is not necessary to predict receivers' decision-making behaviour,
5. measuring 'black box' activities directly is impossible and therefore provides no useful predictive information (Housel, 1985).

In short, these models assume that decision makers are rational and guided by 'innate' mental mechanisms or decision heuristics and therefore are obliged to be make rational choices. This

simplified description of the input-output models of decision making is not meant to be a comprehensive representation of these approaches. Rather, it provides a useful departure point for comparison with the two-stage cognitive model described in the current study.

The two-stage cognitive model

The study proposes a two-stage cognitive process model for decision making. During the first stage, the loan officer uses his/her perceptual processes to evaluate the loan information. It is assumed that decision makers have perceptual bias (Casey 1980a, 1980b), specifically conceptual driven or data driven biases, by which they are influenced in making a preliminary analysis of the stimulus information.

During this initial stage of processing, the loan officer may reach a decision if pressured to do so. However, it is more likely that the loan officer will make a preliminary analysis, based on his/her perceptual biases, during the first stage and perform a deeper analysis in the second stage. Following the second stage the loan officer makes a decision whether to grant the loan (frequently submitting his or her decision to a credit committee for final approval).

The second stage of processing involves the loan officer's judgmental processes as he/she makes summary inferences based on the filtered information produced during the first processing stage. The second stage provides the loan officer with access to organised memories derived from his/her past loan experiences, allowing the officer to compare the current loan case with prototypical loan cases that the officer has developed to help judge new loans. The summary inferential judgments that the loan officer makes are then combined to arrive at the final decision.

MBTI

One line of research posits the existence of bias caused by perceptual predispositions in decision makers toward conceptually driven or data driven analyses of stimulus information (such research uses the Myer-Briggs Type Indicator (MBTI) as that of Casey, 1980a, 1980b). Neisser (1976) refers to the presence of biasing predispositions in his study of visual information processing by referring to an 'anticipatory schema' (p. 20) which predisposes receivers to look at certain aspects of a stimulus image. Making an *a priori* commitment to test the effect of the conceptually driven and data driven predispositions overcomes a serious limitation in studies where the researcher assumes that 'subjects attend to any cue for which it is reasonable for the researcher to assume, *ex ante*, a significant relationship between the cue and a decision variable' (Birnberg and Shields, 1984, p. 366).

In this study, the MBTI (used to identify conceptually driven and data driven types) was used to separate the decision makers according to their biasing predispositions. The MBTI has proved reliable in identifying conceptually driven and data driven perceptual predispositions over the many years of its use (e.g., Mason and Mitroff, 1973; Henderson and Nutt, 1980). The assumption was that perceptual biases would influence the judgments of decision makers and would ultimately influence the decision outcome. The use of the covariance structural causal model made the testing of this assumption possible.

Experience versus Lack of Experience

Using both experienced loan officers who have been taught to develop and employ loan schemata and naive accounting students who stated that they had no prior loan-making experience or specific training in this area, this study was able to compare the effects of prior context-specific experience on the judgment process. This important distinction between the two kinds of decision makers is referred to by Neisser (1976):

The difference between a skilled and an unskilled perceiver is not that the former adds anything to the stimulus but that he is able to gain more information from it: he detects features and higher-order structure to which the naive viewer is not sensitive. (p. 20)

In addition, this study was able to examine the effect of perceptual biases (i.e. conceptually driven or data driven) on the judgment process in both naive and experienced subjects.

Graduate students were expected to be more reliant on the loan case information because they lacked the prior experience in making loans and therefore had ill-defined or non-existent schemata for loan making. Loan officers with data-driven perceptual biases were also expected to rely heavily on loan case information because of their bias toward the use of all information available. Consistent with the active receiver assumption put forward by this study's model, conceptually biased students were also expected to rely heavily on the case information and override their perceptual biases in response to the demands of the task (deciding to award or not award a loan). For this reason, it is the conceptually driven loan officers who should exhibit significantly different decision processes, gauged by the effect of their perceptual bias on their judgment processes, rather than the students and the data driven loan officers.

Conservatism Bias

Past research (Edwards, 1982; Slovic, Fischhoff and Lichtenstein, 1977) found that experienced decision makers tend to be more conservative. This bias may manifest itself in the current study with

the loan officer group. However, the current study partitions the variance accounted for by decision makers' perceptual biases as well as their potential bias toward conservative decision making. Specifically, if experienced loan officers tend to reject more loans, whether bad or good, this study will be able to segment the effects of biasing perceptual predispositions.

Methods

Subjects

Subjects participating in the study were 59 Master of Business Administration students (who reported having no previous loan-making experience) enrolled in a graduate financial accounting course at the University of California; and 50 loan officers from large and small commercial banks in the Los Angeles metropolitan area. From the results of the MBTI test, the 59 students were divided into two groups: 21 data-driven types and 38 conceptually-driven types; whereas the 33 loan officers who completed the task were divided into 17 data-driven types and 16 conceptually-driven types. The MBTI was selected because there is an increasing research base (Mason and Mitroff, 1973; Myers, 1980) which supports the use of the MBTI and demonstrates its high reliability (i.e. in the 0.80 range).

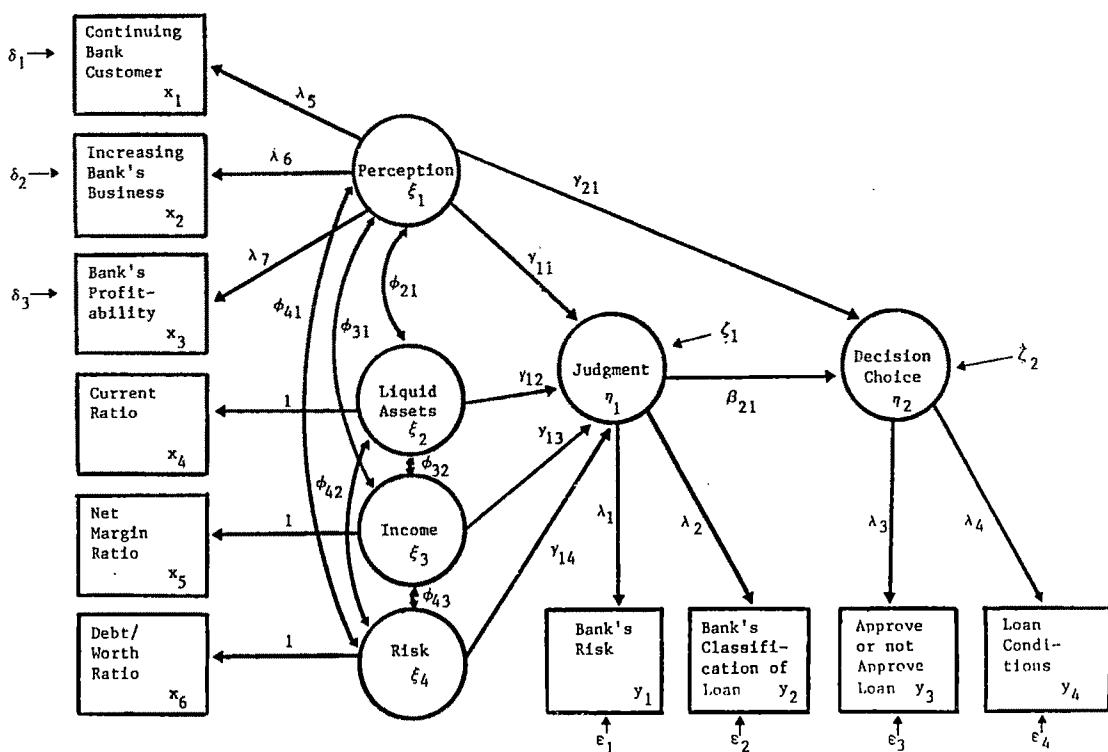
Task

The independent variables represent financial statement information and decision makers' perceptions, while the dependent variables represent the decision makers' judgments and decision choices. Each subject received ten randomised and unnamed cases from five good and five bad companies. Selection of these companies was random and based on Moody's classification of bonds and stocks (B = good risk companies; C = bad risk companies). Company data were taken from the Compustat tapes and represented information from ratios, income statement, balance sheet, and statement of changes in financial position.

The cases and measurement instruments were delivered to each loan officer at his/her place of employment, and to each student in class. The importance of understanding cognitive behaviour was emphasised to the subjects, and they were given feedback regarding their information gathering techniques.

In the instructions given to the subjects, they were told that the objective of the study was to compare the importance of various information items in forming their decisions about whether a company should receive an unsecured \$1,000,000 line of credit for one year. After the subjects read each case, they were asked to evaluate it: 'give your perceptions of the company, make judgments

Figure 1
Loan officers' decision making processes



concerning credit worthiness, and make the loan recommendation'. Subjects were asked to place a tick along a line scale that reflected their opinions about the case company on a scale of excellent to doubtful.

This loan classification system was patterned after the system used by the Office of the Comptroller of the Currency (1973; Dietrich and Kaplan, 1982) and was used to measure loan officers' perceptions, judgments, and decision choices.

Model Testing

A one-way analysis of variance (ANOVA) method was used to determine if significant differences in decision choices between data-driven types and conceptually-driven types exist. The covariance structural model technique was used to determine how well the data from the experiment fit the model (Figure 1). The Joreskog-Keesling-Wiley (now widely known by the copyrighted name of the computer program LISREL; Joreskog and Sorbom, 1981) was used. LISREL analyses the observed variables (information risk factors, perception, judgment, and decision choice) and unobserved variables (e.g. loan officers' perceptions of financial condition of a company) in the following manner.

Covariances among the observed variables are decomposed into two conceptually separate steps. First, covariances among the observed variables are linked to unobserved or latent variables through a factor analytic model (similar to that found in psychometrics: Bentler, 1983). Second, the causal relationships among these unobserved variables are specified through a path analysis model (similar to that found in econometrics: Bentler, 1983). The covariance structural model encompasses the simultaneous specifications of a factor model and a structural equation model.

Specification Model

Following Joreskog and Sorbom's (1981) notational method, squares in the diagram are used to represent observed variables, and circles are used to represent unobserved variables. The covariance structural model in Figure 1 consists of four latent exogenous variables of perception, liquid assets, income, and risk ($\xi_1, \xi_2, \xi_3, \xi_4$) and two latent endogenous variables, judgment and decision choice (η_1, η_2).

ξ_1 represents subjects' perceptions. This latent variable (perception of the new customer) is measured by the following three indicators (X_1, X_2 and X_3). X_1 represent perception questions B, C and D in

the questionnaire; question 'A' was excluded due to problems of multicollinearity):

- X_1 : as a regular bank customer,
- X_2 : increasing bank deposit accounts and other bank business, and
- X_3 : in terms of the bank's potential profitability.

ξ_2 , ξ_3 and ξ_4 represent financial statement information in terms of liquid assets, income and risk of a company, respectively. ξ_2 is measured by X_4 , which is current assets. ξ_3 is measured by X_5 , which is the net margin ratio. ξ_4 is measured by X_6 , which is the debt/worth ratio. These ratios were used in the model because loan officers generally rely on these ratios when they are considering a short-term loan request (Cole, 1984). That is, they represent liquidity, income and risk, respectively.

η_1 is subjects' judgments. This latent variable is measured by two indicators, which represent loan officers' analyses of a company's information and their evaluations of the loan in terms of (Y_1 and Y_2 represent judgment questions A and E in the questionnaire; questions B, C and D were excluded due to problems of multicollinearity):

- Y_1 : their bank's share of risk, and
- Y_2 : their bank's classification system of the loan.

η_2 represents subjects' decision choices, a latent variable which is measured by two indicators (Y_3 and Y_4 represent decision choice questions A and B in the questionnaire):

- Y_3 : whether the loan should be approved, and
- Y_4 : conditions of the loan.

These indicators were selected on the basis of bank procedures for analysing business loan applications (see Cohen *et al.*, 1966; Cole, 1984; Hempel *et al.*, 1983). Also, empirical results supporting these indicators were based on the practices observed at two large banks by Cohen *et al.* (1966). They found that the results of the loan officers were highly similar even though they were located in different cities.

According to the model depicted in Figure 1, perception affects (γ_{21}) judgment and decision choice directly. Perception and financial statement information are correlated (ϕ_{21} , ϕ_{31} , ϕ_{41} , ϕ_{32} , ϕ_{42} and ϕ_{43}). Financial information affects judgment directly (γ_{12} , γ_{13} , γ_{14}) and judgment affects (β_{21}) decision choice directly.

Assessment of Fit

Before proceeding with the estimation, identification of the model was established. That is, the parameters of the model were algebraically solved to determine their uniqueness. Maximum likelihood (ML) was then used to estimate the model parameters (see Lee & Jennrich, 1979).

The behaviour models were tested individually before testing was performed on the group nested models. The purpose of such tests was not to

explore data but to test the goodness of fit of each behavioural model. To do this, each model was compared (nested) to a null model. The difference in the null model from the loan officers' cognitive processes model (invariant model) is equivalent to a test of whether the structural coefficients of information, perception, and judgment differ significantly from zero.

These parameters are fixed in the null model since subjects' perceptions, judgments and use of information are the parameters tested in the hypotheses. The chi-square statistic used for this test was the 'difference' between the goodness of fit chi-square statistics obtained for the null and the invariant models, respectively. The difference chi-square has degrees of freedom equal to the differences between the degrees of freedom of the two goodness of fit chi-squares. Since the difference chi-square tests of the difference between these models was significant, the decision makers' process model was accepted (see Bentler, 1983).

Results and discussion

The results replicated prior research (Rodgers, 1985; Slovic *et al.*, 1977) demonstrating the superiority of prior experience and a global orientation in loan decision performance. This study also extended the prior research by analysing the intermediate decision processes between information input and decision behaviour.

The following analysis will focus on a comparison of students' and loan officers' perceptions, judgments and decision choices. A one-way Anova was conducted to compare the four subject groups of conceptually-driven loan officers (CLOs), data-driven loan officers (DLOs), conceptually-driven students (CSs), and data-driven students (DSs) on decision performance for all loans (i.e. good and bad loans). There was a significant effect $F(3,898) = 5.3$, $p < 0.001$.

Tukey's *a posteriori* tests were used to isolate the specific effects among the treatment groups. Contrary to prior research findings (Casey, 1980a), the data-driven loan officers outperformed the conceptually-driven loan officers in making overall correct loan decisions (Table 1). The conceptually-driven loan officers turned down significantly more good loans than did any of the other groups (see Table 1). These results indicated that this type are more conservative than all other groups (Tversky and Kahneman, 1982; Slovic *et al.*, 1977). Casey (1980a) found that conceptually-driven loan officers make superior decisions. Our study findings contradict Casey's (1980a) in that his study did not take into account the perceptual biases of the loan officers. These results contradict former research (e.g. Casey, 1980b) which indicated that conceptually-driven loan officers always outperform data-driven loan officers.

Table 1
Differences between subject groups (Tukey's a posteriori tests)

Good Loans

	<i>DS</i>	<i>CS</i>	<i>DLO</i>	<i>CLO</i>
DS 1.00	1.00	1.08	1.05	1.17
DS 1.00	0	0.08*	0.05	0.12*
CS 1.08		0	0.03	0.04
DLO 1.05			0	0.07*
CLO 1.12				0

Bad Loans

	<i>DS</i>	<i>CS</i>	<i>DLO</i>	<i>CLO</i>
DS 1.62	1.62	1.63	1.78	1.85
DS 1.62	0	0.01	0.16*	0.23*
CS 1.63		0	0.15*	0.22*
DLO 1.78			0	0.07
CLO 1.85				0

*Significant p < 0.05.

Key

DS = data-driven students

CS = conceptually-driven students

DLO = data-driven loan officers

CLO = conceptually-driven loan officers

Companies Classified as 'Good'

	<i>Data-Driven</i>		<i>Conceptually-Driven</i>	
	<i>Do Not</i>	<i>Loan</i>	<i>Do Not</i>	<i>Loan</i>
Loan officers	94%	6%	89%	11%
Students	100%	0%	96%	4%

Companies Classified as 'Bad'

	<i>Data-Driven</i>		<i>Conceptually-Driven</i>	
	<i>Do Not</i>	<i>Loan</i>	<i>Do Not</i>	<i>Loan</i>
Loan officers	22%	78%	15%	85%
Students	38%	62%	37%	63%

Companies Classified as 'Good'

	<i>Data-Driven</i>		<i>Conceptually-Driven</i>	
	<i>Do Not</i>	<i>Loan</i>	<i>Do Not</i>	<i>Loan</i>
Data-Driven	94%	6%		
Conceptually-Driven	89%	11%		

Companies Classified as 'Bad'

	<i>Data-Driven</i>		<i>Conceptually-Driven</i>	
	<i>Do Not</i>	<i>Loan</i>	<i>Do Not</i>	<i>Loan</i>
Data-Driven	22%	78%		
Conceptually-Driven	15%	85%		

The process model proposed in this research assumes that perception, judgment and decision choice are interdependent processes and therefore must be tested within one simultaneous path analysis made possible when the covariance structural model (LISREL) is used. The results of this model analysis indicated which independent parameters, i.e. perceptual biases and information (liquidity, income and debt ratios), had a significant impact on judgment among the four subject groups. The influence that these parameters had on judgment

explains the significant differences between the experimental groups. This perhaps explains why the DLO failed to outperform the CS on all but one of the significant independent parameters of loan making.

Conceptually-Driven Students versus Data-Driven Students

There were no significant differences between the CSs and DSs on the perception and judgment measures: df = 1, $\chi^2 = 3$, p < 0.10. This finding

raises a question about prior research (Henderson and Nutt, 1980) which found significant differences between the two groups. The MBTI test which divided according to their natural perceptual predispositions allowed this analysis to tease out the confounding error that may have affected the results of the prior studies.

Conceptually-Driven Students versus Data-Driven Loan Officers

The interesting finding in this comparison was that the DLOs used liquidity information significantly differently ($df = 1, \chi^2 = 4, p < 0.05$) than the CSs did. This finding indicated that the DLOs' judgments were significantly more affected by the liquidity information than those of CSs. That is, DLOs were more selective and data-limited in the information that influenced their decisions than were the CSs. There were no significant differences between the two groups on any of the other parameters.

Conceptually-Driven Loan Officers versus Students

Perception influenced CLOs significantly differently from its influence on CSs and DSs. Also, CLOs were significantly different ($p < 0.05$) affected by liquidity information than were CSs and DSs. Finally, there was a nearly significant difference between CLO and DS ($p < 0.10$) types affected by income information. Apparently, the CLOs relied on experience to enable them to outperform the students on loans classified as bad. However, DSs outperformed the CLOs on the loans classified as good. This result points to the conservative approach that loan officers may have taken to arrive at their loan decisions. That is, loan officers may have misaggregated data instead of relying upon the individual diagnostic meaning of the data (Edwards, 1982; Rodgers, 1985).

Data-Driven Loan Officers versus Conceptually-Driven Loan Officers

There was a significant difference between DLOs and CLOs on the perception affecting judgment measure ($df = 1, \chi^2 = 16, p < 0.05$). This finding supports prior research (Henderson and Nutt, 1980) which found significant differences between the two groups. On this kind of measure, another significant difference was that the two groups processed liquidity ($df = 1, p < 0.10$) and income information ($df = 1, p < 0.05$) differently. This adds support to the selective processing hypotheses (Tversky and Kahneman, 1973) that individuals may anchor their judgments on certain types of information before they make their final decisions.

Conclusions

The most important contribution that this study makes to the existing literature on decision making

is the development and testing of a two-stage cognitive processing model of decision making that takes into account the simultaneous effects of direct (i.e. perception affecting decision choice) and indirect (i.e. perception affecting judgment which affects decision choice) cognitive processes on decision behaviour. The covariance structural model analysis (i.e. tested with the LISREL program) revealed the direct effects of information and perceptual predispositions that other loan decision research found. However, the indirect effects of perception via judgment (stage two), also demonstrated that the different perceptual predispositions (i.e. conceptually driven and data driven) and different kinds of information (i.e. liquidity, income and leverage) indirectly affect decision choice.

More importantly, this analysis of indirect effects is a first step in examining the different ways that decision makers use information in the decision-making process. Understanding these subtle and indirect effects will help educators to develop new approaches to teaching decision makers how to avoid errors in judgment when decision making. The use of the MBTI, to identify decision makers' perceptual predispositions, allowed a more refined analysis of the indirect effects of perception in the loan decision process than former cognitive models which focused exclusively on testing the direct effects of these predispositions.

The MBTI categorisation method was useful in comparing the experienced loan officers' decision processes with the inexperienced business students' decision processes. While the differences in actual loan decision performance were predictable, the indirect decision processes that lead to the final decisions could be examined. As the results pointed out, experienced CLOs use loan information differently from all the other participants. And, even though DLOs performed no better than DSs and CSs, the cognitive processes they used to arrive at their final decisions were different.

The results of this study indicated that, while decisions among the different types of decision makers might have been the same, the cognitive processes they used to reach these decisions were significantly different. This study's approach will help pave the way for further research on the indirect and simultaneous effects of decision makers' cognitive processes on their final decisions.

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Allocations and the Validity of the Incremental Principle

R. C. Skinner

Abstract—The proposition that common costs need to be allocated for the purpose of investment decision making is examined. Allocation is, in practice, frequently carried out in order to assist in long-run decision making. The theoretical arguments against allocation are, it is argued, invalid. Legitimacy of allocation does not imply, however, that incremental analysis needs to be abandoned or modified. The available evidence suggests that fully allocated cost is likely to be a good estimate of long-run incremental cost.

Introduction

It is sometimes the fate of those who propound new ideas to be either ignored or misunderstood. The article by Burrows in the *Australian Accountant* (1973) was ignored. When he presented a clearer and more explicit statement of his position (Burrows, 1982), he was misunderstood, by Bird and Bailey (1983). The development by Coulthurst (1986) of the Burrows approach to non-incremental common costs in capital budgeting is to be welcomed but, unfortunately, it also shows some evidence of misunderstanding and it does not go nearly far enough. The Burrows approach gives rise to three questions. Is it a common practice to allocate costs for the purpose of long-run decision making? If the answer to that question is affirmative, is allocation acceptable in principle as a legitimate activity? If the answer is also affirmative, does that mean that the incremental principle is incorrect?

Allocation practices

Coulthurst (1986) discusses only the first of the above questions. He points out (pp. 359-360) that often capital investment cut-off rates are high even for normal risk projects, and that this is attributed by some companies to the need to cover non-revenue-earning projects. Coulthurst suggests that these are likely to be cases where high rates are used as an alternative to the allocation of common costs and common capital investment. That inference is not justified. What may be involved is a need to undertake non-profit-generating projects, a problem which has been recognised for many years in investment decision making. Typical projects of that kind are investments carried out due to legal requirements (relating, for example, to health and safety matters), those resulting from social welfare considerations (such as pollution control measures and employee welfare facilities beyond minimum

statutory requirements), and those concerned with pure research or designed to increase a company's prestige. Investments of the last type may be carried out in the hope of obtaining substantial monetary returns, but often the returns will be so uncertain that, for investment evaluation purposes, it is assumed that the projects will have no impact on revenues. The proposal that the cut-off rate on profitable investment should be increased to offset the effects of non-profit-generating investments can be found in Ashton (1962, p. 33), Batty (1963, pp. 433-4) and Childs (1964, p. 21). It is possible that a thorough search of the literature would reveal that the proposal goes back even further than a quarter of a century. While an increase in the discount rate for that purpose may be considered desirable, it certainly cannot be claimed to be invariably necessary. The discount rate is typically a minimum earning rate. If that rate is usually exceeded when projects are implemented, the excess may be sufficient to offset the effects of non-profit-generating investments.

The problem examined by Burrows (1973, 1982) is a different one. It is one that will arise in companies which have no non-profit-generating projects, or which have them but choose to make no adjustment with respect to them. The problem is that of costs common to many investment projects. The problem was noted by Batty (1963, pp. 433-4) but, like other writers before Burrows, he did no more than mention the problem. Burrows argues that the difficulty arises with replacement, as opposed to expansion, investments. When a project comes to the end of its economic life, it does not happen that administrative staff are discharged and then re-engaged when the replacement project begins. It would be foolish to do so merely in order to convert their salaries into costs that are indubitably incremental to the replacement project. The same argument applies to most other administrative expenses, such as rent and property

taxes. Capital investment discount rates are typically based on returns to whole businesses or business segments (like divisions) and, as such, reflect the incidence of all costs. If the discount rates are used on data which omit major items of common cost, a business's rate of return objective is unlikely to be achieved.

The solution proposed by Burrows is the allocation of the common costs to the projects. Coulthurst (1986) points out that, as with an adjustment for inflation or for risk, an increase in the discount rate can be used instead, but that, as in those cases, it is not likely to be a satisfactory alternative. He also shows that the size of the increase needed in the rate is much larger than might be expected.

As evidence of the way the problem identified by Burrows is handled in practice, Coulthurst (1986, p. 360), referring to a joint work of his own published in 1984-85, cites the case of Unilever, which he claims uses fully allocated data as a supplement to a purely incremental approach. I suspect some confusion here. Bennett (1981, p. 674), financial director of Unilever Australia, has written that, in his company, 'the pure cash concept is usually modified to take account of items common to the overall business, e.g., for a share of indirect expenses and back-up capital'. There is no mention in that article of the approach being used as a supplementary one. Indeed, it should not be used in that way. If the Burrows arguments are wrong, allocation should not be used at all. If the arguments are correct, allocation will usually be necessary, with at least replacement projects. There would, typically, be difficulties in deciding which common costs should be allocated to the projects, and how, due to the empirical problems of applying the principle that costs should be allocated according to the factors that are judged to be their causes. In these circumstances, sensitivity analysis is likely to be helpful, based on different levels (and possibly methods) of allocation. Perhaps that is what is intended by Coulthurst's discussion of 'supplementary indicators'.

The best evidence for the use of allocated data in long-run decision making is provided by Fremgen and Liao (1981). In their survey, performance evaluation purposes were the most commonly quoted reasons for allocating, and such purposes lie outside the scope of this article. For purposes of decision analysis, which is the concern here, 64 per cent of their respondents allocated at least some of their corporate indirect costs to profit centres (Fremgen and Liao, 1981, p. 41). That finding is discussed in more detail below.

The legitimacy of allocation

The severest critic of allocation has been Thomas (1974, particularly). His main objection to

allocation statements is that they are 'incorrigible', meaning not empirically testable. This is because (according to him) they do not describe states or events of the real world, but report the states of mind of the allocators. His other major criticism is that allocations are 'arbitrary', i.e. not theoretically justifiable, meaning that a particular method of allocating cannot be conclusively shown to be superior to alternative methods. Thomas (1980, particularly) has conceded that allocations can be useful, in the sense that they can help achieve the objectives of the organisation. He has, however, compared belief in allocation to belief in witchcraft, so his concession is not likely to satisfy most proponents of allocation.

Thomas's arguments have never been explicitly refuted: the attempt to do so by Eckel (1976) was a very weak one. Lip service is often paid to Thomas, but otherwise his arguments typically are disregarded, both by researchers and by authors of management accounting texts. The most frequently quoted article on allocation is by Zimmerman (1979), who ignored Thomas and set himself the task of explaining why and how allocations are useful. The latest edition of the most widely used text, Horngren and Foster (1987), also does not mention Thomas. Wells, who has been almost as severe a critic of allocation as Thomas, has conceded in a recent article (Wells, 1984) that the days of blanket condemnation of allocations are now in the past. The inference to be drawn from these attitudes to Thomas is that his arguments are thought to be invalid, and so conspicuously so that the point does not need to be argued. My opinion is that they are invalid, but that the point deserves to be argued. The case against Thomas is outlined below and is presented more fully in Skinner (1986).

A problem with Thomas's arguments is that it is by no means clear to what extent his claims that allocations are incorrigible and arbitrary are intended to apply to management accounting, apart from the special case of the allocation of joint costs to products that must be produced jointly, such as hides, meat, bones and tallow in a meat works. It has long been accepted in management accounting that there is no managerial justification for such allocations. It by no means follows, however, that the same is true of the allocation of common costs between independent products that happen to be, but do not have to be, produced together. Thomas's claim of arbitrariness is typically not true of such common cost allocations. The cause-effect criterion has long been part of the conventional wisdom in management accounting: costs should be allocated according to the factor or factors which cause them. So, for example, a machine hour rate rather than a direct labour hour rate would be used in a cost centre where the cost to be allocated is primarily that of owning and

operating machinery. The criterion is by no means always easy to apply, particularly where fixed costs are concerned, but that is a practical difficulty, not a theoretical problem. The existence of the criterion is sufficient to refute Thomas's accusation of arbitrariness.

Thomas's claim of incorrigibility is also not typically justified. For the purpose of decision making, for example, it is necessary that allocation should be of some help in the estimation of incremental costs. There has never been any serious doubt about its usefulness in the case of the allocation of variable common costs in the estimation of short-run incremental cost. Whether or not the allocation of fixed common costs is helpful in the estimation of long-run incremental cost is more debatable, but it is a matter that can be empirically tested. This point is returned to below. Empirical testability does not necessarily mean, of course, that the issue can be resolved with a high degree of probability, but merely that some objective evidence of the matter is obtainable.

The incremental principle

Does the Burrows approach imply that the incremental principle is incorrect? That would be a disturbing conclusion. The principle is almost a matter of common sense. It stipulates that, when a course of action is proposed, only those financial items that would be affected by the action need be taken into account in computing the likely financial effects of the decision. In the last sentence it would not be correct to replace the word 'need' by 'must'. It has been pointed out by Skinner (1971, pp. 73-4) that, if costs common to the existing situation and an alternative situation are included when evaluating the alternative, that ought not to affect the decision since the unavoidable costs will cancel out when the existing and alternative situations are compared with each other. It has been argued by Dillon and Nash (1978), however, that the inclusion of unavoidable items could possibly affect the decision. For example, the decision on a proposal that would change a firm's profit by a given money amount could be influenced by the existing level of profit, since that level would determine the proportionate size of the proposed change. Computing the existing profit would obviously involve including items that would not be affected by the proposal. This point does not (I think) require an amendment to the incremental principle, since it can be argued that the firm's existing profit is incremental in the sense that it would all be lost if the firm ceased to exist.

The last point is related to a problem commonly encountered in applying the incremental principle, namely, that of choosing the base situation relative to which changes are to be evaluated. This difficulty, like those above, is (I believe) a practical

difficulty, not a conceptual problem. Suppose the machinery used in one section of one department of a factory needs replacing. Before attempting to measure incremental costs and revenues, it is necessary to answer the question, 'incremental relative to what?' Should the decision maker be concerned with the extra costs of (say) salaries and insurance premiums applicable to the new equipment relative to those of the old? Or should the decision maker be concerned with changes relative to the costs and revenues that would have existed if the old equipment had never been acquired? The latter interpretation would be the relevant one for the decision to replace the equipment. As in this case, the appropriate interpretation is unlikely to involve a difficult choice. On the interpretation mentioned, the salary of the section supervisor could well be considered an incremental cost, but what about the salaries of the department manager and the factory manager? If such costs are ignored in making the replacement decision, on the grounds that they are not incremental costs, the difficulties pointed out by Burrows will arise.

It is possible to regard such items as incremental costs by adopting an extension of the Dixon viewpoint. In a very well known article, the title of which has become part of business jargon ('incremental creep'), Dixon (1953) argued that allocated full cost is likely to be the best available estimate of the long-run incremental cost of any permanent additional activity. Although he does not explicitly discuss the point, he presumably also believes that it is the best available estimate of the long-run cost savings of any permanent reduction in activity. A justification of Dixon's viewpoint is that rationally operated businesses function in the long run at balanced full capacity: any permanent increase (or decrease) in activity is likely to be accompanied by a proportionate scaling up (or down) of capacity and therefore by a proportionate increase (or decrease) in all those costs that are, in the short run, fixed. To cover the difficulties pointed out by Burrows, Dixon's viewpoint would have to be extended to cover replacement decisions.

The distinction between replacement decisions and expansion or contraction decisions is often not clear cut. A business should not take for granted that each machine should be replaced by the current version of the same machine (which will, in any case, frequently be an improved version). The business should consider not replacing at all, which would be a contraction decision. It should also compute the effects of replacement by a radically different type of equipment, which would be a decision involving both replacement and either expansion or contraction elements.

Zimmerman (1979) makes a point that is similar to that of Dixon. He argues that allocations can act as useful and inexpensive proxies for a number of

hard to observe costs, including the costs involved in the expansion of internally provided services. An extension of the Zimmerman viewpoint is that repeated increases in the usage of a service will usually lead to an expansion of the service, and so an increase in its fixed costs. He also propounds arguments relating to the consumption of prerequisites, but that issue, like the performance evaluation uses of allocations, lies outside the scope of this article.

We know that many accountants believe that allocated full costs are the best available estimates of long-run incremental costs. In the survey of Fremgen and Liao (1981, p. 68) mentioned above, 49 per cent of those who allocated cited this as a reason for doing so for decision-analysis purposes. There is, however, no direct evidence available as to whether that belief is correct, either for all long-run decisions or just for expansion and contraction decisions. Correctness of the belief in the case of all decisions implies that a firm's long-run average cost per unit is constant, as opposed to rising, as is believed by classical and neo-classical economic theorists, or declining, as is believed by those in managerial economics who think there are no upper limits to economies of scale.

Wiles (1961, pp. 238–262) surveyed a large number of empirical cost studies and his conclusion was that the long run average cost curve of most firms is L-shaped. The evidence examined by Wiles included a substantial number of studies based on cross-section statistical analysis, which is likely to give less reliable results than the alternative technique of engineering estimation. Silberston (1972, p. 376) summarised a wide-ranging study which used the engineering approach. His conclusion about the typical long-run average cost curve was: 'Most of the evidence suggests that such a curve will be L-shaped, i.e., will fall at first and then become horizontal. The point at which the curve becomes horizontal is the minimum optimum or efficient scale.'

The typical firm is not likely to be operating in the long term at a point where its average cost is above the minimum level, nor be considering contraction to a point where average cost would be higher than it currently is. If that proposition is correct, fully allocated cost is likely to be a good estimate of long-run incremental cost for both replacement and expansion or contraction decisions. Evidence from empirical cost studies is indirect, but it is amply sufficient to refute Thomas's claim of lack of empirical testability. Evidence of a more direct nature is certainly desirable, but such evidence would undoubtedly be very difficult to obtain.

Conclusion

I find convincing the Burrows arguments about

the need to allocate common costs in making investment decisions, and the Coulthurst argument that adjusting the discount rate is not likely to be an acceptable substitute. I believe, however, that the need for allocation does not arise from a conceptual fault in the incremental principle. If that principle were to be abandoned, we would then have no basis on which to identify relevant costs in long-run decision analyses. The difficulty can be met by adopting and extending the Dixon viewpoint.

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Book Reviews

The Logic of Mergers. The Competitive Market in Corporate Control in Theory and Practice Brian Chiplin and Mike Wright. Institute of Economic Affairs, Hobart Paper No 107, 1987. 90 pp. £3.50.

This is a worthy successor to the now outdated 1970 pamphlet in the Hobart series by Brian Hindley. It brings the perspective of the fourth great merger wave of the 1980s to bear on the now well-worn issues of mergers and the efficiency of the market for corporate control. The new features of recent years—particularly changes in financial markets, increases in the size range of firms which are vulnerable to takeover, and the growing tendencies to deconcentration through management buy-outs and the like—are given particular attention. This is not only timely but delivered with authority: the authors are respectively Director of the Institute of Financial Studies and Director of the Centre for Management Buy-Out Research at the University of Nottingham. As a comprehensive and judicious survey of the existing British literature on mergers and the recent UK experience this pamphlet is without peer.

I had two worries about the approach. First, there is continued reiteration that empirical evidence on the characteristics of firms taken over can do nothing to disprove the hypothesis of an efficient market in corporate control. The argument is the usual latent variables catch: since it is the threat of takeover which compels incumbent management to perform well, an observation that good managements are just as likely to be taken over as bad can just as easily be taken to mean that the market is working (therefore mergers occur for different reasons) as that it is not. The problem with this is, of course, that the hypothesis therefore becomes pretty well non-falsifiable: the authors might have given more attention to the question of alternative tests. However, this is perhaps inappropriate in a survey pamphlet, and the authors are too honest not occasionally to point to market imperfections which make their own pro-market stance on this implausible.

My second area of concern is their too easy dismissal of the transaction costs weaknesses in the market for corporate control argued by John Kay. Kay's point, I take it, was that, while managerial performance may be improved by the threat of takeover, the extremely heavy costs of this mechanism (in bid and defence costs etc.) greatly exceed expenditure on most other means of achieving the same ends (e.g., management education). Furthermore the market does not appear, in the case of the

former at least, to allocate costs and benefits appropriately: there are substantial competitive imperfections and public good (and public bad) elements in the market for corporate control. This point is not effectively answered by the authors, though they do demolish other aspects of Kay's anti-merger cautions.

All this does not detract from the capacity of the book to stimulate. It can be highly recommended.

London School of Economics Leslie Hannah

Pinson on Revenue Law. Barry Pinson with Roger Thomas. 17th ed., Sweet and Maxwell, 1986. lxxx + 780 pp. £38.

About three hundred years ago Lord Halifax suggested that: 'Laws are generally not understood by three sorts of persons *viz.* by those that make them, by those that execute them, and by those that suffer if they break them'. Such a comment is particularly relevant to that enormous body of knowledge which makes up modern revenue law. In his preface to this general survey, Pinson quite rightly points out that any book which aims to provide a comprehensive account of revenue law will be bulky and may be unreadable.

This book does not set out to be comprehensive, though with nearly 800 pages it does, of course, cover a considerable amount of material. Instead, the aim is to provide a 'statement of the fundamental principles of revenue law' and 'to state those principles in as readable and intelligible a form as the subject-matter and the need for conciseness allow'. This it does quite successfully. It is therefore a useful volume for its target readership which consists of practitioners and students following professional courses.

Part 1, which accounts for over half the length of the book, deals with taxes on income and capital gains. It is divided into four sections: namely the taxation of the income of non-corporate bodies; the taxation of companies; the taxation of capital gains and finally administration, assessments and back duty. Part 2 is concerned with inheritance tax; Part 3 with stamp duties; Part 4 with value added tax, and finally Part 5 turns to some issues in tax planning.

The main difference between this and the preceding edition is that the former includes changes arising from the Finance Acts of 1985 and 1986 which include, for example, the abolition of development land tax and the change from capital



transfer tax to inheritance tax. The law is stated as at 30 August 1986, though with new editions appearing every year or so the work is being kept up to date.

Overall this book makes a good job of presenting subject matter which is often hideously complicated, and it does so in a single convenient volume.

University of Exeter

Simon James

Reporting Fixed Assets in Nineteenth-Century Company Accounts. J. R. Edwards (ed.). Garland Publishing, 1986. 570 pp. \$40.

This collection of reprints is an addition to the Garland series 'Accounting Thought and Practice Through the Years'. The question 'How best in financial reports to indicate the periodic cost of long-term capital expenditure?' presented itself first in a major way in the early days of railways. It is not surprising therefore that the topic of railway accounting gets the lion's share of space in this volume. For descriptions of the practical treatment of depreciation and capital/revenue allocations outside the public utility field students would do well to refer also to the editor's *Studies of Company Records 1830–1974* (reviewed in the Winter 1985 issue of this journal).

The level of the items selected for inclusion in the volume under review varies, particularly where interpretation of the facts, rather than the facts themselves, are concerned, but there is much to interest and instruct the discriminating reader. The editor has divided the 27 items into four groups, apparently arranging items within each group alphabetically (in all but one case) by author's name. However, I think the subject matter is too intertwined to make this treatment useful. My recommendation to readers, other than those who merely wish to pick out one or two of the texts for study, is to ignore the grouping and read through in the order of the original dates of the papers. I suspect this will put the development of thought and practice into better perspective, the more so as there is a good deal of overlap, particularly in the articles of later date.

The editor's preface rightly draws particular attention to the reports of 1848, 1849 and 1853 by Mark Huish and others. Huish was general manager of the London and North Western Railway. The reports deal with the depreciation question as it then appeared in relation to the long-term assets of a new technology, belonging to an undertaking with a widely spread and fluctuating shareholding—a new situation. They reveal a clearly expressed insight into fundamentals, not always present in present day discussion. The implied conceptual basis of profit calculation is

that of maintaining the level of future dividends in a context where distribution in full was normal practice.

The Huish reprints are unique in the volume in that they give the views of a man actually in the thick of railway management. Apart from the depreciation question, they throw a light on the kind of capital investment decisions that mid-19th century railway management had to cope with. The paper by T. R. Gourvish tells us about Huish and his problems and sets his reports in context. (This is an exception to my suggestion that the papers be read in date order).

From 1853 the volume jumps to writings around the last twenty years of the century on 'how it is done' or 'how it should be done'. These include a reprint of the chapter on fixed capital in the 1893 edition of Garcke and Fells, *Factory Accounts*, and the first chapter of the 1903 edition of Matheson's *The Depreciation of Factories*. Contemporary views and doubts about the uncertain implications for profit reporting of the double account system, and of legal judgements on dividend distributions, are reflected in three other papers of the same period, one being the 1888 paper by Ernest Cooper, later President of the ICAEW for three years.

After a 1918 chapter by Wang, reviewing railway accounting in Britain from the 1830s to 1911, there are three reprints from the 1930s, all of which pay particular attention to railway accounting, mainly in the USA. These are Littleton's chapter on the early treatment of fixed assets, from his *Accounting Evolution to 1900* (1933); Perry Mason's 1933 collection of quotations on depreciation accounting from 1675 to 1873; and G. O. May's 1936 article which discusses the possible (favourable) consequences of neglect of depreciation provision in early American railroad accounting, and the impact and interaction of federal regulation and Supreme Court decisions.

Jumping on another twenty years, we have Pollin's paper of 1956, 'Aspects of Railway Accounting before 1868', one of the key items in this collection, as can be seen by the number of citations of it in the later papers.

The remaining papers date from 1963. Three appear for the first time. There continues to be a heavy emphasis on 19th century railway accounting. Description and discussion of the double account system and its implications feature prominently, as do references to the dividend cases. A new paper by Roydon Roberts deals with the accounting of a gas undertaking between 1823 and 1900. An interesting feature of this is the description of the auditing activities: up to 1858 (when the undertaking's new private Act brought into play the auditing provisions of the Companies Clauses Consolidation Act of 1845) the auditors were all members of the committee of management and

seem to have behaved more likely a supervisory board in the continental style than a modern auditor.

Another new paper, written jointly by the editor and C. T. Brown, describes how, up to 1920, accounting in a quarry company—not a public utility—appears to have been influenced nevertheless by the double account system. It is pleasing to see that J. Kitchen's 'Lawrence Dicksee, Depreciation, and the Double-Account System' (1974), which pulls together and analyses the various influences operating in Britain at the turn of the century, is included. This deserves special mention.

Richard Brief's papers of 1965 and 1966 remind us of the important point that if one writes of conceptual error in accounting measurement one necessarily implies the acceptance of a defined ideal set of principles. This is a counterbalance to a tendency in some of the other papers, as it seems to me, to judge 19th century accounting and accountants on the basis of present day received views on objectives and means of achieving them.

A terminological point that struck me is the use in some papers of the term 'cash-based accounting' for reporting that is in fact accrual-based so far as current assets and liabilities are concerned, but deals with fixed assets in an arbitrary way and uses replacement accounting. For me, cash-based reports are simple cash receipts and payments statements. To use the term in other contexts is, I would argue, not helpful for clarity of discussion.

Despite this grumble, I think the volume should be useful for graduate and advanced undergraduate study as well as providing in an accessible way material and references for advanced work, and it is to be welcomed.

London School of Economics
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H. C. Edey

A Scottish Contribution to Accounting History.
T. A. Lee (ed.), Garland, 1986. 149 pp. \$20.

This book of 14 reprinted historical essays with a strong Scottish theme is a worthy addition to the now enormous Arno/Garland lists. The essays had been variously published between 1970 and 1985, and were mostly written by past or present members of the Scottish Institute's Committee on Accounting History. As Tom Lee notes in his Introduction, the Scottish contribution to the development of modern accounting has been considerable. The book illustrates that the Scottish contribution to the study of the history of accounting continues remarkably strongly.

The first eight papers are described as concerning 'preprofessionalism'. They begin with a typically scholarly and detailed piece by Anna

Dunlop on five examples of Pacioli's *Summa*. Then we are led chronologically from the first Scottish book on accounting; to a discussion of the development of internal control; to examinations of several examples of accounting in various industries.

The next five papers, before a review article by Tom Lee on the evolution of financial accounting, concern 'professionalism'. They range from the broad 'The Emergent Professionals' to the esoteric 'Accounting at Heriot-Watt College 1805–1920' (fortunately, the latter is about the teaching of accounting, not the keeping of the college accounts).

Nearly all these papers are brief. They are all worth reading and easy to understand. Let us hope that the Scottish Committee on Accounting History will continue to play an important role in ensuring that Scotland remains such an obvious centre of excellence in accounting history.

University of Reading

Christopher Nobes

Accounting and Control for Governmental and Other Nonbusiness Organizations. *Leo Herbert, Larry N. Killough and Alan Walter Steis*. McGraw-Hill, 1987. xxii + 666 pp. £34.95.

This text, although on the whole well written, can have little appeal to students outside the USA. Parts I and II of the book introduce students to the broad field of nonbusiness accounting with 'special reference to the financial requirements of governmental units, health and welfare organizations, colleges and universities, and other nonbusiness entities'. All of the references in these first sixteen chapters are from either United States or joint United States/Canadian publications as the text is based upon North American practice.

Part I is designed to provide the reader with an elementary, but thorough, grounding in fund and budgetary accounting. The various chapters include numerous illustrations of the principles and practices under discussion, and each chapter concludes with a set of review questions and problems. With this basic understanding of government accounting the procedures established are then applied in Part II to other nonbusiness entities including health and welfare entities, labour unions, and foundations.

Parts III and IV consist of only three chapters each. Part III essentially adapts basic management accounting principles to a non-profit oriented environment. Chapter 17, the first in Part III, acquaints the reader with the basic elements of a management control structure. In addition, basic cost concepts and cost estimation techniques are introduced. Chapter 18 then introduces those cost accounting techniques that the authors consider

most likely to be used by government and other nonprofit entities. Rather strangely, whilst process and job costing receive some prominence, the potential for the application of variance analysis is dismissed in one paragraph. The final chapter in this section, chapter 19, attempts to cover far too much material in only fourteen pages. For example, break-even analysis is covered in two pages and cost-benefit analysis is covered in less than four pages.

The objective of Part IV is to place the principles and practices of accounting into a broader context of modern management. In chapter 20 various systematic procedures for the more effective achievement of organisational goals are discussed and illustrated in terms of management's responsibility for establishing controls to monitor their efficiency and effectiveness. Topics covered include strategic, management and operational planning and control, and programme budgeting. Techniques for monitoring and evaluating the efficiency of operations of a governmental or other nonbusiness unit are briefly covered in chapter 21. The final chapter considers control through performance auditing. There is a useful discussion on the wide spectrum of auditing approaches encompassed by this term. This chapter provides a basis for the student to understand (i) the distinction between efficiency of operation and the effectiveness of goal attainment and (ii) the methods of determining through an audit whether an organisation's operations have been efficient and whether goals have been accomplished.

In summary, this text provides a basic introduction to government accounting and control for a specifically North American readership.

University of Kent
at Canterbury

John J. Glynn

Mandatory Financial Information and Capital Market Equilibrium in Belgium. *Gabriel Hawawini and Pierre A. Michel.* Garland Publishing, 1986.
271 pp. \$25.

This book sets out to investigate the impact of mandatory financial disclosure changes on security prices of firms traded on the Brussels Stock Exchange. Financial reporting in Belgium was revolutionised by the Royal Decree on Accounting Standards and Financial Reporting enacted in October 1976. The purpose of the Decree was to require firms to disclose information which would be useful to investors in assessing the risk-return prospects of securities. The book reports the findings of a research study carried out to test the success of this goal.

The book contains six chapters. Chapter 1 consists of a brief introduction summarising the objec-

tives and findings of the study. Chapter 2 provides an institutional background with a brief history of accounting legislation in Belgium prior to the Royal Decree, followed by an examination of recent legislative changes including the details of the Decree itself. Chapter 3 covers the analytical framework used to test the impact of the Decree on security returns. The empirical test consisted of an examination of the difference between stock returns of 50 firms which had not complied with the Decree before its enactment and the returns of firms that had complied voluntarily prior to its enforcement.

Chapter 4 reports the results of the test with reference to the impact of the Decree on the returns and variance of returns of the relevant securities. Informational effects were found. In particular, the share prices of a significant subgroup of firms which did not voluntarily disclose data prior to the legislation dropped significantly in response to the legislation. These findings contrast with Chapter 5 where it was found that there were no effects on the systematic risk of disclosing firms. Reasons for this result are discussed in the chapter. Chapter 6 summarises and discusses the empirical results followed by an appendix containing the format and content of financial statements required by the Royal Decree.

The authors argue that their findings reported in Chapter 4 are consistent with market efficiency criteria. It is not clear, however, why a negative response to the release of the Decree as distinct from disclosure compliance with the Decree is necessarily consistent with efficiency. If these firms were known to be likely to use limited disclosure to hide their underlying weaknesses one would have expected this to be reflected in share prices without any Decree requiring them to improve the disclosure practices.

The book is clearly of interest mainly to specialist readers, to whom it is strongly recommended. However, it is also recommended for library purchase because its chapters on research methods and design have a wider relevance to students intending to carry out a market study of information effects.

University of Glasgow

Simon M. Keane

The Accountant's Magazine: An Anthology. *Colin Storrar.* Garland Publishing, 1986. 163 pp. \$20.

This extremely varied collection of extracts from *The Accountant's Magazine* should provide something of interest to most readers. Since the articles are arranged in chronological order they provide an indication of topics that have been of interest to members of the Scottish Institute and serve to illustrate how little change there has been in the range of topics discussed. For example, in 1913 an

article reflects the amazement of the writer at the speed and accuracy to be obtained from the application of a punch-card system, but by 1936 readers of the article on mechanised accountancy are being warned that the salesman is only intent on selling his machine, whether or not it is the right machine for the job. Similarly, in 1903 there is a hint of censure against the Inland Revenue, should they dare to question figures put forward by a qualified accountant. This attitude is repeated very strongly in 1924 in an article on the accountant's relationship with the Inland Revenue, where readers are advised that any challenging of figures by an Inspector of Taxes should immediately be reported to his supervisor. There is also a complaint that many of the problems in this area of practice arise because much of the work is delegated by Inspectors to subordinates who are more difficult to deal with.

An article in 1905 attempted to make a very strong case for the usefulness of cost accounts, which was repeated in expressing the need for examinations in this topic in 1906. However, the content of the 1946 article on budgetary control and standard cost, which presumably was considered to be quite revolutionary in its day, now seems extremely elementary. The 1952 article on price level accounting concludes that the problem is a political one which cannot be solved by altering accounting principles—a view which is perhaps still shared by a fair proportion of accountants.

Presumably the 1953 article on the first Summer School was included for nostalgic reasons and will be familiar to many members. It is interesting to compare this with the 1908 article on a visit to the 21st AGM of the American Association of Public Accountants, where there is more mention of the social aspects than the professional ones and where the anonymous author considered the lack of alcohol to be worthy of mention.

Perhaps it would have been better to abandon chronology in this anthology in favour of a grouping of subjects. Indeed it might have been interesting to devote the whole anthology to one, or a few, clearly defined topics such as cost accounting. However, the nature of an anthology is such that any individual would produce a different choice of articles for inclusion and anyone who has spent some time browsing through the volumes of *The Accountant's Magazine* is sure to miss some article which has interested them.

The claim that '... TAM, as the joint production of a fragmented profession, played a unique part in welding together that profession' is perhaps somewhat extravagant and fails to take account of the fact that *The Accountant* began publication in 1874 and was widely read in Scottish, as well as English, accounting circles and makes rather spicier reading, particularly in its editorials. Nevertheless, this is an enjoyable volume, which is

guaranteed to provide a few hours of pleasure and escape from the turgid reading which is more often our duty.

University of Hull

Moyra J. Kedslie

Accounting Bibliography: Historical Approach.

Walter Hausdorfer. Bay Books, 1986. xiii + 512 pp. US \$31.60.

A bibliography is an unusual work to review and this particular bibliography is more unusual than most.

The introductory pages of this work contain: an Editor's Note by A. van Seventer (the typewritten script was edited to a limited extent, mainly in terms of correcting errors); a note on the author, by Miriam I. Crawford; an Introduction by Basil Yamey; and a Preface by Walter Hausdorfer. Before reviewing the bibliography itself some explanation about Hausdorfer (culled from *The Author*) and the provenance of his bibliography will be illuminating.

Walter Hausdorfer was a distinguished librarian as well as a scholar and collector of rare books and manuscripts. Of German background and American birth (1898) he graduated from Temple University in 1925 with Honours in Modern Languages. Following a year's employment as assistant librarian in the University's library he enrolled at the Columbia University School of Library Service, obtaining his degree in 1927 together with a job in the New York Public Library. He continued his studies and received his Master's degree in Library Service from Columbia University and employment in its School of Business Library (1930). By a happy coincidence, in 1926, Montgomery (of Lybrand, Ross Bros. & Montgomery and *Montgomery's Auditing fame*) donated to Columbia University his collection of old and rare books to form the Montgomery Library of Accountancy (*The Early History of Coopers & Lybrand*, p. 39, Lybrand, Ross Bros. & Montgomery, 1949, reprinted New York, Garland Publishing, 1984). This served as an inspiration to Hausdorfer for his bibliography.

After sixteen years at Columbia he returned to Temple University as head librarian. An anonymous donor provided funds for the purchase of manuscripts and books in business and economic history, which Hausdorfer used to acquire unique early documents of accounting and business history from ancient times to the nineteenth century.

Hausdorfer completed the original typewritten script of his bibliography by at least April 1962. He approached a number of publishers with his bibliography without success, publishers fearing there

would be too limited a market for such a book. Hausdorfer died in 1970 and the typewritten manuscript was found among his working files.

The main text of Accounting Bibliography is divided into eight parts. Parts I and II are merely the abbreviations used and a key to location symbols where works can be found.

Part III, First List—Printed Works and Manuscripts, as the name implies, is a listing of primary source material, organised in alphabetical order by author. The Preface explains that this is 'not intended as a definitive bibliography, but a useful compilation, a starting point for the student of this subject'. For example, most European works after 1801 are excluded, except where they have been reprinted or adapted in America. On the other hand American works to 1910 (an arbitrary date) have been included. There is a small amount of annotation to some entries and the locations of the works are provided.

Part IV provides a listing of Accounting and Bookkeeping Periodicals produced before 1910, of which there are nearly fifty.

Part V may have followed more logically immediately after Part III and from the Preface this seems to be what was intended. It gives a Chronological Index to First Printed Works and Manuscripts, citing the author or title and the place of publication. Part VI is a listing of Bibliographies and Biographies.

Part VII, Accounting History: A Bibliography, provides an alphabetical listing by author of books and articles on the history of accounting. Many of the entries have a large amount of very good and useful annotation. This is followed by Part VIII, a Subject Index to the previous section giving, according to the advertising blurb, 469 accounting topics.

Professor Yamey's introduction to the work is also something of a review (he did in fact review the entire manuscript before publication); it is difficult to follow such an eminent authority. Accounting Bibliography is extremely useful since it contains both primary and secondary sources covering a wide range of languages; this would seem to be where Hausdorfer's linguistic ability played an important part. The Bibliography is only limited in scope by the constraints set by Hausdorfer, as already explained, and the fact that it was completed in the early sixties. However, as Yamey comments, Hausdorfer's work 'nicely complements the work of R. H. Parker' (ed. *Bibliographies for Accounting Historians*, New York, Arno Press, 1980). Professor Parker's own bibliography is now a number of years out of date but it is understood that an update is due out shortly. Yamey admits that 'there are a few omissions—but these are surprisingly few'; particular articles omitted by Hausdorfer are 'the series of papers on individual authors and their works by E. Stevelinck and R.

Haulotte published in the Belgian journal *Documentation Commerciale & Comptable* under the heading "Galerie des grands auteurs comptables" from 1956 onwards'.

Accounting Bibliography is undoubtedly an important reference work for any library and an essential research tool for the serious accounting historian. As Yamey comments, almost like an advertising slogan: 'Random samplings over a short period have convinced me, however, that "Hausdorfer" will be an indispensable source and guide'.

Hausdorfer began his Preface 'For more than six centuries the system of recording and analyzing business transactions has received the attention of writers throughout the world. Surely this subject is worthy of more historical study by accountants and historians than it apparently receives.' No doubt he would be pleasantly surprised by the developments which have taken place in accounting history since he wrote his Preface in 1962, especially the establishment of The Academy of Accounting Historians and the first publication of *The Accounting Historian*, later *The Accounting Historians Journal*, in 1974. Ironically, it may well be that the increased popularity of accounting history has led, finally, to the publication of Accounting Bibliography 25 years after its completion.

It is to be hoped that Hausdorfer's Accounting Bibliography will be an inspiration to future students of accounting history.

University of Kent at Canterbury Peter Boys

Accounting for Management Control. Clive Emmanuel and David Otley. Van Nostrand (UK), 1985. xii + 289 pp. £10.95.

As the blurb on the back of this text points out, there are many books concerned with accounting for decision making but this is one of the few to stress accounting for control. The aim of the book is to complement the traditional accounting texts which develop technical accounting calculations backed by economic concepts; the design of an effective management accounting system is seen as requiring knowledge obtained from the behavioural sciences and from the principles of organisation and management as well as from economics.

The authors' view of the breadth of knowledge required for effective management accounting design is probably so widely accepted that it is now the conventional wisdom. The difficulties arise in selecting and integrating the appropriate mixture from a number of ever-expanding fields. However, the authors are particularly well qualified for their

task; both have made notable contributions to the literature of accounting for management control.

The book is divided into four unequal parts. Part 1 comprises four chapters on the context of management accounting, introducing organisational control and proceeding to organisational design (with due attention to contingency theory), rewards and motivation and the nature of management tasks and information. These chapters provide a careful and valuable guide for students who would otherwise find the literature far too extensive to assimilate. The tone is caught by a comment on the organisational literature that 'early work has a tendency to prescribe solutions, whereas more recent work is more reflective in nature'; these chapters, like most of the book, are firmly in the latter category.

Part 2 deals with programmed activities, defined as those activities for which an adequate predictive model exists. There are just two chapters: accounting for decision making, and budgetary planning and control. This reversal of the traditional emphasis is entirely consistent with the aim of the book, but the approach implicitly assumes that the student already has a firm grasp of more conventional material. Thus the decision making chapter is largely devoted to a simple linear programming example for a divisionalised firm, which might suggest to the uninitiated that LP is a technique solely applicable to the transfer pricing problem. Another example of the need for a good background understanding is an observation in the chapter on budgetary planning and control that '... price setting ... requires information about ... production costs (certainly variable costs, and in the longer term arguably full costs) ...'; the cryptic statement in brackets is never explained. However, in terms of providing a succinct exposition of behavioural issues, the chapter on budgetary planning and control is particularly well done. It also contains a statement which deserves to be borne in mind by every reader and writer in this area: 'Managers seem to use imperfect accounting measures in more complex ways than is commonly suggested in accounting texts'.

Part 3, the largest in the book, covers non-programmed activities. These are interpreted as relating mainly to the control of divisionalised enterprises. Functions like marketing, advertising, and R&D, which might be thought to epitomise non-programmed activities, never make an explicit appearance. Perhaps the explanation is that this book is essentially concerned with those issues of management control which have preoccupied the academic accounting literature, where divisionalisation has loomed large and the marketing/R&D functions have loomed very small indeed.

The chapters which make up Part 3 cover planning and control, performance measurement and evaluation, transfer pricing and capital investment

in the multidivisional company. The planning and control chapter has a well-balanced section on a theoretical framework for non-programmed decision making, going on to consider aspects of uncertainty, control loss, participation, feed-forward control and planning implications. These are all topics on which the student should find the book's integrated treatment helpful.

Performance measurement/evaluation and transfer pricing are both developed with an emphasis on behavioural issues which fits well with the previous material. But the arguments on the allocation issue might have been better coordinated between the two chapters. Whereas the transfer pricing chapter is very effective in exploring the equivocal relationship between transfer pricing and allocation, the performance chapter simply categorises head office allocations as wholly arbitrary and needless, making only a fleeting reference to Zimmerman (*Accounting Review*, 1979) and offering no serious discussion of why allocations are so common in the observed behaviour of firms. The transfer pricing chapter is particularly successful in walking the difficult tightrope between the behavioural and economic issues, and offers an interesting approach based on a proposal by Emmanuel and Gee; this material might be accessible to a student without prior understanding of transfer pricing, although a grounding in the conventional analytical arguments would be desirable.

The chapter on capital investment in the multidivisional company starts with the contentious issue of the relationship between central and divisional management in capital investment decision making. It then proceeds into the equally contentious areas of ROI, RI and cash flow measures. There must be very few academics who agree on all of these topics, so the authors inevitably offer views which can be used in teaching to stimulate student discussion. Among the points of departure for this reviewer is the argument that if top management allocates capital resources between divisions the investment decision 'must be assumed to take place in a stable, if not completely certain environment' (p. 221). Even arms-length providers of capital like financial institutions allocate resources in unstable environments; it is difficult to see why top management of divisionalised companies must be assumed to be less capable.

The final part of the book has a single chapter which usefully draws together many earlier strands. It revisits the accounting information system in the context of contingency theory, and surveys the fields of non-programmed decision making and performance measurement before considering likely future developments.

Overall this is a book which undoubtedly achieves its aim. It is particularly welcome because there is no comparable work which covers the

issues of accounting for control in such a comprehensive manner, and those of us who have already adopted it as essential student reading have found that it works well on advanced undergraduate courses.

University of Bristol

Don Egginton

Accounting. An International Perspective. *Gerhard G. Mueller, Helen Gernon and Gary Meek.* Richard D. Irwin, 1987. xvi + 166 pp. \$10.95.

Finance. An International Perspective. *Arthur I. Stonehill and David K. Eiteman.* Richard D. Irwin, 1987. xiv + 142 pp. \$10.95.

The two books under review form part of a series of six volumes produced under the direction of the Consortium for International Studies Education with support from the US Department of Education. The four others in the series are: 'Introduction to Business'; 'Issues for Managers'; 'Management'; and 'Marketing'. The aim of the series is 'to provide an international dimension for the core functional courses in business administration for colleges and universities'. Although written for an American audience the books could be used by British undergraduates who have completed suitable introductory courses and by postgraduates as parallel material.

The Accounting text covers such topics as international financial reporting; setting accounting and auditing standards internationally; comparative disclosure practice and recognition of price changes; multinational consolidation; accounting information systems, planning, control and performance evaluation in multinational corporations; multinational transfer pricing; and international taxation. The Finance text covers foreign exchange rates and markets; foreign exchange risk management; working capital management; international sources of funds; cost of capital and financial structure; and capital budgeting for foreign projects.

Both books contain problems and cases for student use but the Accounting book, unlike the Finance book, does not contain any guides to further reading (which are more likely, perhaps, to be of use to teachers than to students). The authors are well known for their more advanced textbooks and they again demonstrate their ability to hold the attention of the reader. Both books can be strongly recommended as very good short introductions to their respective subjects.

Writers on international accounting and finance naturally find it more difficult than their domestic counterparts to get all their facts right and keep their books up to date. The present writers are not immune. Mueller, Gernon and Meek, for example, claim that Australia, Canada and New Zealand are

former Commonwealth countries (p. 81) and Stonehill and Eiteman imply that all members of the EEC are also members of the European Monetary System (p. 23). It is no longer true that 'French Law does not require consolidations at all' (*Accounting*, p. 87).

These minor slips do not detract from two very good examples of textbook writing.

University of Exeter

R. H. Parker

De Paula's Auditing. *Frank A. Attwood and Neil D. Stein.* Pitman, 17th ed., 1986. 682 pp. £13.95.

What approach should one take to reviewing the seventeenth edition of a well known standard auditing text? I decided that I would try and apply the principles of value for money auditing. Would *de Paula's Auditing* give good value? My first task naturally was to see what the book itself had to say on that subject. That was my first disappointment! The book does not provide coverage of performance auditing in any of its guises. Indeed there is little or no coverage of public sector auditing or of internal auditing. These are the most notable omissions. The book does provide thorough coverage of private sector company auditing and in this respect is a considerable improvement upon the sixteenth edition. There is also a most useful and comprehensive chapter on special types of audit. This chapter takes 62 pages to cover the audits, *inter alia*, of solicitors, insurance brokers, pension schemes, banks, insurance companies and housing associations.

The stated objective of this book is to give a student orientated approach, providing complete coverage of the auditing syllabuses of all the main UK accountancy bodies. Certainly several of the UK bodies include public sector and internal auditing in their auditing syllabuses, and so I could only award an 'except for' report on coverage. For the student, the book has a number of worthwhile features:

- * an opening chapter indicating which of the subsequent chapters are relevant for each examination;
- * a detailed study guide to help students in planning their work;
- * end of chapter summaries to aid revision;
- * progress questions to test understanding;
- * a clear and concise writing style.

In view of the student orientation it is perhaps surprising that past (or specimen) professional examination questions are not included at the end of each chapter. Their inclusion would help the student to see how the material of each chapter is examined.

Frank Attwood is a partner in Robson Rhodes

and a member of the Auditing Practices Committee. The book, although written in clear language, is influenced by the type of presentation often found in audit manuals and official pronouncements. In this respect it is not so very different from most of its competitors. Perhaps a certain amount of officially inspired tedium is an inevitable part of the study of auditing, at least at the practical level? It remains a matter for speculation as to whether the increasing computerisation of the audit process will change the nature of the practical auditing examinations and the nature of the supporting texts, and whether this will in turn lead to any less tedium!

The book is not for leading practitioners or for academic courses in auditing. Discussion on topical and philosophical issues is distinctly limited, and there is no reference to the burgeoning research literature on auditing. These are significant lapses in a book on auditing even if it sets out as a professionally orientated text. To ignore the wider discussion of these matters heightens the risk of an auditing profession which has little appreciation of the nature of auditing, its value to the community, and its future directions. The point can be illustrated by reference to the increasing computerisation of the audit as mentioned in the last paragraph. Conscious of the development effort going into expert systems I looked for 'expert system' in the book's index, but I looked in vain!

However, I do not wish to be too critical since many of the faults attributable to the book are in substantial measure imposed by the limited horizons of our profession's examiners and the need to provide the publisher with profits! They can also be attributed to almost all of the (UK) competitors to this text. Almost everyone seems to want to produce a Ford Cortina—long running and reliable but not for the enthusiast and almost certainly not the shape of things to come.

University of Edinburgh

David Hatherly

Varieties and Uses of Financial Information. *R. J. Chambers and F. L. Clarke.* University of Sydney, Accounting Research Centre, Monograph No. 6, December 1986. 75 pp.

This compact but quite readable monograph contains almost all that one needs to know about continuously contemporary accounting (CoCoA). First, Chambers and Clarke report on responses from Australian accountants to a survey conducted by them in 1984. Then Chambers summarises the results of similar surveys conducted in Australia, Canada, New Zealand and the United States over the years 1980–1984.

As well as showing that, in general, the surveys

produced very similar results, the text includes the basic arguments in favour of CoCoA and outlines Chambers' case against historical costs, current costs, and current values. The first Australian survey produced a few rogue results which were corrected in the later survey by making the form of the questions more precise. Interestingly, the authors found in the second Australian survey large majorities who consider that the current (or replacement) cost of assets provide, in respect of current assets, an indication of the funds accessible to meet current liabilities, and, in respect of total assets, an indication of the effective asset cover for debts of a company. These results are dismissed by the authors as 'surprising'.

The authors interpret their results to support the use of 'dated asset selling price, and no other price' for non-money assets; to support the recognition of 'unrealised gains'; and to support some adjustment for the effect of inflation.

The questions in the surveys are very precise and the results of the surveys certainly can be interpreted to favour CoCoA. Why then has CoCoA not been introduced? Chambers and Clarke identify several forms of coercion which, they say, 'undercut the test of utility'. They are: teaching, peer group pressure, attitudes of clients, and statutory or regulatory prescription. These are formidable 'coercions' to overcome and represent an admission by the prime advocates of CoCoA that much has yet to be done. Once Chambers believed that the statutory requirement that accounts give a true and fair view would eventually lead to the adoption of CoCoA. He now believes that there should be more explicit guidance, through either the standard setting or legislative processes, requiring companies to publish their accounts on a CoCoA basis.

London

G. B. Mitchell

Financial and Strategic Management for Nonprofit Organizations. *Herrington J. Bryce.* Prentice-Hall, 1987. xviii + 395 pp. £34.25.

Four themes underlie the discussions in this book. The first is the emphasis placed on viewing nonprofit organisations as economic entities with welfare missions rather than as welfare organisations with welfare missions. Unlike government, both for-profit and nonprofit organisations are subject to the same market test. Do they satisfy the expectations of those who finance their operations (that is, equity shareholders and the providers of debt to for-profit organisations and donors in the case of nonprofit organisations)? All investors seek, in a basic sense, positive results. Failure to live up to the expectations of those that provide the

funding can mean that firms and nonprofit organisations can both go out of business.

The second theme of this book is the legal penalties imposed on nonprofit organisations and their management for violating their statutory powers. The proper handling of the financial management function in any type of organisation requires a good knowledge of the legal limitations and the financial powers given to that institution by law. A third theme is that making profits or surpluses is perfectly consistent with the legal authority of many nonprofit organisations. The author argues that the critical issues are how the profits are made, and in what proportion these profits (or surpluses) stand in respect to other sources of support.

The fourth theme is that the analogy between nonprofit organisations and government is misleading. Governments can tax, write laws and enforce them, declare and operate monopolies, legally restrict competition and even print money. Nonprofit organisations, like firms, can do none of these. Neither of them has a constitutionally enforceable basis to assure their continued financial support. They cannot tax. They must raise their funds in a highly competitive market.

As this is a text intended for the USA, the legal and taxation provisions are based on The Internal Revenue Code of 1954, as amended in 1969, and supplemented by, amongst others, US Treasury regulations, Revenue rulings, Tax Court rulings, and decisions of District and Supreme Courts. This aside, there are some useful chapters that should be of general interest to readers outside the USA. Chapters 10 and 11, for example, are concerned with the productivity of fund-raising activities. The author stresses the importance of understanding the motivation for giving and outlines strategies to be used when making appeals to potential individual and corporate donors. Questions considered include: when is a gift a gift? when is a gift not worth taking? how can gifts be made? Chapter 11 shows how trusts, wills, insurance and endowments can be used to set up intricate mechanisms for making large gifts. As stated, the strategies are very much within a US framework. However, there are plenty of useful principles to note, as well as ideas, perhaps, for those concerned with lobbying for more liberal reforms in their own countries.

Much of the remainder of the book discusses the principles of financial management and is intended as an introduction to readers with only a limited prior understanding of finance. This book will probably have a limited market outside the USA. The structure and presentation of the book is such that one cannot but feel that a UK edition would attract a far wider readership here.

Audit Qualifications in Australia 1950 to 1979.
Allen Craswell. Garland Publishing, 1986. 169 pp.
 US\$22.

The audit report is the most visible aspect of an audit. It is therefore a prime target for the few academics interested in auditing research. There has been much written on the effectiveness of the auditor's report as a means of communication and its impact on share prices has been subjected to increasingly sophisticated analytical techniques. Dr Craswell's research falls into the less glamorous area of gathering empirical evidence on the frequency with which qualifications in auditors' reports occur. With commendable diligence he has examined and analysed more than 33,000 audit reports on the accounts of companies listed on the Sydney Stock Exchange during the period of 1950–1979.

The basic hypothesis being tested was:

Auditors respond to changes in their legal and professional obligations and, to the extent that those changes impinge upon reporting obligations, changes in the frequency of qualifications can be expected to result.

The period under review was chosen because it encompassed two major changes in New South Wales company legislation. The 1961 Companies Act required a 'true and fair view' report on the Balance Sheet and Profit and Loss Account in place of the 'true and correct view' report on the Balance Sheet alone. The Companies Act of 1971 strengthened the independence of auditors by making it more difficult to remove them from office, by entitling them to 'reasonable fees' and by granting them qualified privilege regarding their reports to shareholders.

In addition, in 1971 the Australian Institute published Statement K1 which required members to encourage compliance with professional accounting standards and in the event of non-compliance required auditors to qualify their reports, thus increasing the likelihood of 'technical qualifications'. Furthermore the Hedley Byrne case in 1964 heightened auditors' awareness of the risks of litigation where they failed to report appropriately.

That there were distinct patterns in the incidence of qualified reports cannot be disputed. The statistics show that 'the frequency of qualified audit reports in the 1970s is in sharp contrast to their virtual absence in the two previous decades. From 1972 to 1979, 21 per cent of industrial and 23 per cent of mining companies published qualified reports. In the period 1950 to 1972, only 2 per cent of industrial and 6 per cent of mining companies' reports were qualified'. For industrial companies the majority of the qualifications were 'technical', i.e. non-compliance with accounting standards,

and for mining companies the grounds for qualifying were uncertainty about their continued viability, often expressed in relation to the carrying value of particular assets, e.g. mining leases and capitalised exploration costs.

Craswell has devised a taxonomy for audit qualifications in order to provide a detailed analysis of the 2740 qualified reports in his sample. In spite of the admission that 'because the events [suspected of causing the increase in qualified reports] were virtually concurrent, it is impossible to assess their separate effects', he concludes that 'The major proportion of qualifications given after 1971 could have been avoided by managers agreeing to alter companies' accounts in accordance with auditors' requirements. This would suggest that either managers did not assess the costs of qualified opinions as being high or the costs of avoiding the qualifications were greater'.

Such a finding raises questions about the effectiveness not only of the process of setting accounting standards but also of the auditor's ultimate 'weapon'—the qualified report. However, a subsequent study of the period 1980–1985 revealed that of 3,000 reports of industrial companies only 12 per cent contained qualified audit reports. Craswell is not convinced that this reversal in the trend of qualifications is due to increased compliance with accounting standards but suggests that auditors may have become more willing to concur with the accounting policies selected by management. Only a much more detailed study (dependent perhaps on access to unpublished information) would reveal which interpretation is correct.

If Australian practice in the 1970s mirrored that of UK auditors a third explanation is possible. During that time the practice recommended by the ICAEW was that auditors should qualify their reports for non-compliance with accounting standards even though they concurred with the departure. In 1981 the ICAEW's annual *Survey of Published Accounts* detected 'a most interesting decline in references to departures from SSAPs; this can probably be related to the fact that auditing standards no longer require references to be made unless the auditor disagrees (when, of course, he would qualify his report)' (*Survey of Published Accounts 1981–82*, ICAEW, 1981, Note 1 to Table 4.2, p. 49). In failing to distinguish between 'concurrence' and 'disagreement' qualifications, Craswell's analysis is unable to test this explanation.

London

Roy Chandler

Introduction to Management Accounting. Charles T. Horngren and Gary L. Sundem. Prentice-Hall International, 7th ed. 1987, xxi + 762 pp. £17.95.

The seventh edition of this well known intro-

ductory text has been co-authored by Gary Sundem. The authors state the objective of the revision as increased clarity, and they have certainly produced a text which clearly explains and illustrates the essentials of management accounting. The book is intended for students with little, if any, knowledge of accounting and who are probably studying accounting as a subsidiary subject for one year.

The twenty chapters of the book are divided into six sections. Section One, focussing on Decision Making, includes cost-volume-profit relationships, short-run decision-making generally and opportunity costs. Section Two, Accounting for Planning and Control, includes budgeting, standard costing, cost allocation, responsibility accounting, and transfer pricing. Section Three comprises two chapters on Capital Budgeting. Section Four, on Product Costing, covers job costing and process costing in some detail. The last two sections are of particular interest in an introductory management accounting text. The fifth covers quantitative techniques such as linear programming and inventory models, while the sixth contains four chapters of basic financial accounting.

It is this last section of the book which may increase its usefulness in the UK. In British institutions of higher education, it is not common to find one year courses in management accounting for students with little or no background in accounting. Thus, this book would initially appear to be of limited usefulness. However, with the final section on financial accounting, this text would be appropriate for accounting courses designed for non-accounting students, where the emphasis is on the use of accounting information rather than its preparation, and where there is a leaning towards the use of internal accounting information.

At this point, some of the other positive features of the text will be mentioned. The book is undoubtedly clearly written and highlights the important aspects of the issues being discussed. The writers have taken two themes which appear throughout the book, viz. a cost-benefit theme and a behavioural theme. These ideas are well integrated into the text and give it a flavour of real life, which students will appreciate.

One further positive feature, which the reviewer finds particularly helpful, is the movement away from the traditional practice in management accounting texts of reliance on manufacturing industry for the vast majority of examples. In this text, the authors have a wide range of examples drawn from service industries, the professions, not-for-profit organisations, and the public sector, as well as examples from manufacturing industries.

No text is without its drawbacks and this book is not an exception. First is its Americanness! Non-accounting students for whom the text is intended have enough difficulty picking up the

language and infrastructure of accounting within the UK, which may be already partly familiar. To use a text which requires another set of accounting terminology and institutions to be understood will cause problems. It must be said though that the authors make every effort to explain accounting vocabulary, etc. Second, as is almost invariably the case with US texts, is the problem of length and price. A price of approaching £20.00 will be prohibitive for many non-accounting students, and its size daunting. A final criticism concerns the very limited mention of computers. At a time when microcomputers, especially, are transforming the practice of management accounting, a greater emphasis on this aspect would be an improvement.

In conclusion, this text is well written and presented; it has clarity and is well founded in practical situations. For a one year course with the emphasis on internal accounting information and decision making, this book is well worth active consideration.

University of Bristol

Stephen Lyne

Research and Current Issues in Management Accounting. Edited by Michael Bromwich and Anthony G. Hopwood. Pitman, 1986. 236 pp. £19.95.

The papers included in this book were presented at the fourth Deloitte, Haskins and Sells Accounting and Auditing Research Symposium, held at the London Business School in September 1984. There are 13 papers in the volume, including an introduction and a conclusion by the editors. The papers are divided into four main sections, the first of an introductory character, followed by sections labelled respectively issues in practice, the state of the art of research, and pressures for change. Most of the papers have extensive bibliographies.

Of the 13 authors, three are practitioners and ten are academics. With a few commendable exceptions, the academics seem not to have been at great pains to make their contributions easily understandable by those not already familiar with their fields. Only those who were present at the symposium are in a position to judge how well the academics and practitioners communicated. From a reading of the papers, however, one is left with some doubts as to how much the practitioners may have taken away from their contact with the educators.

Of course, one reason for the communication problem is the constant growth of specialisation *within* the management accounting field. Three main influences at least can now be distinguished, namely, economics, psychology and organisation theory, each with its own proliferating literature. The three longest papers in this collection are devoted to literature surveys in these three areas,

Robert Scapens and John Arnold covering economics, Jacob Birnberg and Kunal Sadhu covering psychology and cognitive research, and Jeremy Dent covering organisational research. Each of these contributions has been carefully researched. Ironically, they seem to be agreed on only one conclusion: management accounting research has had little impact on practice.

The same point is made by Charles Horngren, in his paper on 'Cost and management accounting: yesterday and today'. 'Many academicians seem frustrated and disappointed', he says, 'when they discover that most organizations, including some successful giants, do not use multiple overhead rates, discounted cash flow, regression analysis or flexible budgets' (p. 37). His explanation is that the cost-benefit calculus inhibits change. 'Many managers perceive, rightly or wrongly, that the costs of more elaborate systems exceed prospective benefits'. There is a danger here, as Horngren recognises, that cost-benefit can always be appealed to as justification for preserving the status quo, especially as it is usually easier to quantify costs than benefits.

Both Horngren and Scapens and Arnold comment on how little we still know about how business decisions are made, and this, too, may help to explain why theory has not had more impact on practice. To quote Scapens and Arnold, 'what is largely missing from the management accounting literature at present is systematic evidence concerning the way decisions are taken within firms and the information which is available. There is a need for empirical research into how individual firms construct and use management information systems and why they adopt particular procedures. The results of such research may eventually permit the development of improved management accounting theories' (p. 97).

A correction may already be under way. Several contributors comment on the change of emphasis in the recent literature away from normative statements about what managers *should* do in favour of attempts to ascertain and explain what they do do. But a word of caution is in order. However salutary such a trend may be, might it not lead eventually to the abandonment by academics of all responsibility for innovation?

Robert Kaplan's paper, 'Quantitative models for management accounting in today's production environment', is my selection as the outstanding contribution to this symposium. It looks at modern manufacturing technology and finds that 'our existing stock of models do not capture contemporary phenomena'. With the advance of computer-integrated manufacturing, variable costs have been reduced to a small fraction of total cost; fixed costs have not only become more important, but are less easily traceable to specific products, and are sunk in such factors as software, product

design, and highly specific equipment. Thus even a simple model like breakeven analysis must be looked at differently than in the old days.

Classical optimisation models, such as EOQ, are in one important respect misconceived, Kaplan argues: '... so-called optimal decisions from a quantitative model are optimal only if the conditions and parameters of the model are assumed to be immutable with respect to managerial actions' (p. 112). It follows that 'what has been omitted from these models is what makes a manager successful', that is, not accepting conditions passively, but rather taking an unsatisfactory situation and turning it around. The parameters that go into an EOQ model are not beyond the control of a manager. A more extreme example that Kaplan cites of a manager changing the 'immutable' is lobbying city hall to get a tax abatement during difficult times.

A notable gap in the coverage of the symposium papers—it is one that textbooks usually ignore also—is the marketing function. None of the speakers ever refers to it, though Kaplan does devote some space to distribution. The public sector gets one paper, and recent developments in information technology are the subject of an interesting paper by Andrew McCosh. This paper, by the way, will bring little comfort to management accountants who see themselves threatened by changes in their field. Indeed, by and large, there is as much cause for concern as there is for optimism in this book about the future of management accounting. The brightest opportunities for advances may lie elsewhere in the management field.

University of Pennsylvania,
The Wharton School

David Solomons

Corporate Financial Reporting and Analysis in The Early 1900s. *Richard P. Brief (ed).* Garland Press, 1986. ix + 234 pp. \$24.

This is a book in the Garland series 'Accounting Thought and Practice Through the Years'. The idea in this case is a good one: to make more widely available several American documents from the early 1900s which may interest accountants today and 'may stimulate further research into the area' (Introduction). The resulting book is, however, rather disappointing.

The book consists of three parts (after a short 3-page Introduction): a set of recommendations for improving financial reporting in the United States made by T. W. Phillips in 1902; four 'notable' corporation reports for years between 1902 and 1911; and several pieces of contemporary financial statement analysis by Dr T. W. Mitchell of the University of Pennsylvania, reprinted from

the *Journal of Accountancy* between October 1906 and September 1907.

The book fails to provide any context within which to set these rather disparate offerings. Phillips makes sensible recommendations, but there is no hint as to the reason for a US Industrial Commission being set up at the turn of the century, nor of any significance in its Final Report being published in 1902. Was Phillips influenced, for example, by the UK 1900 Companies Act's (revived) requirements for company accounts to be audited? Phillips himself strongly urges compulsory audits by independent experts.

The selection of corporation reports in the second part of the book is rather arbitrary and unsatisfactory. As the Introduction states: 'there is no special rationale for reprinting these particular annual reports other than the fact that each has several points of interest'. Yet there is little sign of what the editor regards as these 'several points of interest'.

The first of the reports is the first for US Steel, for the year ended 31 December 1902, described by the editor as 'a milestone in the history of financial reporting'. But it can only be considered a 'milestone' in terms of the huge size of the newly merged company. All the technical innovations involved in this early set of consolidated accounts had already appeared, in the accounts of one of the major constituent parts of US Steel, namely the Federal Steel Company. Federal Steel's first annual report for the year ended 31 December 1899 was 'audited' by W. J. Filbert, later comptroller of US Steel, and the companies were both controlled by J. P. Morgan through former judge Elbert Gary and George Perkins. There was little 'notable' about the US Steel accounts beyond the fact that they showed a ten-fold increase in assets over Federal; later writers have shown how greatly inflated (or 'watered') these US Steel asset values actually were.

The second set of accounts are those of International Harvester for 1909. This was neither its first set of accounts, nor apparently especially interesting. As the editor points out, the company's report 'is similar in format to that of US Steel, but since both companies were under the influence of J. P. Morgan & Co., the similarity is not surprising'. (In fact half International Harvester's Finance Committee also served on that of US Steel.)

The third set of accounts are for American Telephone and Telegraph, 1910. Again there is nothing very special about the year, save for a very long 'Public Relations' section from Theodore N. Vail, AT&T's President. This is reproduced in full, and occupies forty pages of the book. It is, frankly, not worth it. Moreover there have been plenty of precedents even from the same company; the 1908 accounts, for example, present similar special

pleading, only much more concisely. Could these not have been chosen instead? Indeed one of the earlier constituent companies, the Western Union Telegraph Company, for the year ended 30 June 1873, presents a full rehearsal of the same issues some thirty five years earlier, including the contents of detailed letters from William Orton, the president, to Secretary of State Hamilton Fish, to the editor of the *New York Times*, and to the editor of the *New York Herald* during 1873, all rebutting allegations of profiteering (and using arguments which might today interest Bryan Carsberg in his current Ofstel role).

T. W. Mitchell's analyses are of interest, but, just as with the rest of the book, the material lacks a context. In particular, Professor Brief suggests in his Introduction that: 'Why some companies were more advanced in their ideas of accountability is an interesting question and merits further study. Perhaps companies like US Steel issued detailed annual reports in the belief that this information would reduce the perceived risk of creditors and shareholders and lower the cost of capital. Another explanation is that improved disclosure would satisfy demands for reporting by critics of big business and reduce political costs'. These are not mutually exclusive: both are likely to be true. But the book does nothing to address the question. Indeed it obscures some important issues by failing to distinguish between *regulated* and *unregulated* reporting environments at the time.

References appear in the text to the Interstate Commerce Commission, to reporting requirements of the internal revenue and to nationwide controls over banking companies. Yet there is no hint in the text that the railroads had been companies of great economic importance for some fifty years already, with extensive and detailed published financial and operating statements for much of that time and a powerful public regulatory commission.

Some of the material published relates to the regulated environment, and other parts (US Steel, International Harvester and Westinghouse reports, in particular) relate to environments either free of regulation or controlled by different public institutional arrangements.

Professor Brief says that 'this book is not a systematic study of corporate financial reporting and analysis in the early 1900s'. How valuable it would be if it were.

University of Lancaster

Michael Mumford

Accounting and Information Systems. John Page and Paul Hooper. Prentice-Hall International. 3rd ed. 1987, xiii + 738 pp. £16.95 pbk.

From the beginning, I must declare a possible bias in the review of this book. This is because previous

editions have been recommended textbooks for a particular course at the University of East Anglia over the last seven years, although not without criticism from some of the faculty.

As may be expected from the title, it is not surprising that such a book should be very systematically organised. It is divided into four parts of four chapters each, with two appendices. The four parts deal in turn with accounting systems, systems concepts, information systems and systems development, with one appendix containing a manual bookkeeping case study and the other a systems case study. Basically, this means that the reader is introduced to accounting with a strong cybernetic systems bias although the intention is obviously to describe accounting at its most fundamental level owing to frequent references to manual systems. The second part brings in data processing under the misnomer of systems concepts with particular emphasis on communications and databases, both of which are currently very important aspects of business information systems. The following part combines the first two in a rather narrow interpretation of information systems where great attention is paid to traditional bookkeeping aspects of accounting, namely cash receipts and payments and sales and purchases systems. The final part deals with systems analysis and design and includes a chapter on evaluation and one on EDP auditing.

Several improvements have occurred in the third edition: for example, the incorporation of a chapter on microcomputers plus frequent references to them throughout the text. Furthermore, there has been an attempt to shift the emphasis of the book from one of data recording (financial accounting) to data use (management accounting) especially with the recognition of decision support systems which can with suitable models make ready use of data recorded in computer based systems. There have also been other minor changes such as the rearrangement of material and of course updating to current technology.

Two major points about this book are immediately obvious, given its American parentage. Firstly, for a book about a computer related topic, it is cheap. Many similar books are generally in the £30-£50 range and therefore not available for student purchase. The second point is that it is *not* a programmed text although, as mentioned before, it is quite a highly structured book. Its structured nature is of course both an advantage and a disadvantage, but generally it tends to limit the area in which the book can be used. In other words, it would be of limited use in a third year undergraduate UK university course where students may be approaching their subject from a critical and perhaps anarchistic viewpoint (in the manner of Feyerabend). Owing to the unusual nature of the accounting programme at East Anglia, such a book has in the past been useful as

a recommended text for an early integrated computerised accountancy course. In this case, it has been initially an advantage to present complex ideas within a simplistic cybernetic framework. However, later in the course and in more conventional programmes at other universities or polytechnics where, for example, information systems may be offered as a third year option, this book would not be appropriate. The reason is that its general tenor is reductionist. It presents both accounting and information systems in a technocratic, unproblematic and uncritical manner. For example, accounting is reduced to a neat system based on the accounting equation ($A = L + E$) with all the attendant inferences that accounting may exist in a context-free environment. This seems to ignore current developments in accounting theory such as the consideration of the relationship between theory and practice. Similar problems arise with information systems: for example, the book makes no reference to the eclectic nature of information systems design, such as the political, social, organisational and economic dimensions which form a large part of current research in this area. Instead, the authors have chosen to ignore concepts like mise-en-scène, multiview methodology and participative systems design, and have concentrated on the simple 'life-cycle' approach to systems analysis and design which avoids the richness of real situations.

This book is probably at the same philosophical level as *Carter's Advanced Accounts* (an old favourite of mine). It is a solid and dependable reference book which will do little to satisfy any intellectual curiosity. It will however provide a solid framework for novice students to react against in the future as they develop their critical faculties at a more advanced level.

University of East Anglia

B. C. Williams

How to Use Management Ratios. *C. A. Westwick.* Gower Publishing Company, 2nd ed., 1987. xviii + 421 pp. £47.50.

This is the second edition of a book which was originally published in 1973. The objective of the book is 'to help directors and managers run their companies or departments more profitably or efficiently'. Business ratios are therefore primarily examined from a management efficiency viewpoint, although the need to examine the accounts of other companies is not forgotten.

The book is divided up into 14 chapters with the first three chapters being concerned with ratio selection, standards of comparison and the calculation process. Most of the following chapters are concerned with ratios from a specialised business viewpoint, e.g. marketing, purchasing, production,

personnel and financial management, as well as the overall perspective of the chief executive. Readers are encouraged to be selective, with instructions provided as to which are the appropriate chapters for different management personnel.

The final chapter on 'ratios in the public sector' covers a considerable amount of new ground which could be of great benefit to those accountants who are concerned with value for money in central and local government and nationalised industries.

The author is obviously a great enthusiast for the use of accounting ratios in improving management efficiency, although there does not appear to have been a great movement in this direction since the first edition of this book appeared 14 years ago. In the UK, Lord Weinstock has for many years been a great advocate of this type of control within the GEC group, although many accountants now feel that closely monitored cash and profit planning techniques provide the key to successful management accounting systems.

Accounting ratios should, however, never be neglected, and the director, manager or accountant who is keen on these techniques will find much of value in this book. The price of £47.50 will probably make many academic accountants hesitate about recommending a purchase for the library, but there is little doubt that this book will find itself on the bookshelf of many accountants in practice, commerce, industry and government.

University of Exeter

P. R. A. Kirkman

Introduction to Financial Accounting. *Charles T. Horngren and Gary L. Sundem.* Prentice-Hall International, 3rd ed., 1987. 795 pp. £17.95.

This book aimed at introductory accounting courses is a companion to *Introduction to Management Accounting* by the same authors. It is neatly divided into sixteen chapters, ranging from the basic balance sheet equations, journals and ledgers, price level accounting and an introduction to the conceptual framework project. Each chapter is preceded by a statement of the 'learning objectives' and is followed by assignment material. In common with other American books, a whole host of teaching aids ranging from a solutions manual to acetate transparencies are available upon adoption of the book.

The authors claim that the book is orientated towards 'the user of financial statements' and 'the thrust is toward understanding generally accepted theory and practice' (p. xv). Having made such promises, what follows often fails to deliver. For example, definitions of items such as assets are too simplistic and unlikely to help in resolving the old problem of whether goodwill is an asset or not.

Does the accrual basis not rest, in many cases, on a false assumption of being able to identify the period that benefits from the expenditure? Having read the works of Sterling and Chambers, it is difficult to conclude that there is an agreement on the meaning of 'going concern convention'. Rather than using the students' awareness of discounted cash flow (covered in the first year of most degree courses) to show a way of estimating economic life of assets, as has been advocated by Baxter in his writings, the authors continue to claim that predicting useful lives is difficult (p. 376) but fail to say why. The authors argue that accounting principles become generally accepted by 'agreement' (p. 54). Could it be that this 'agreement' is manufactured, especially, by text-book authors and teachers who seek easy refuge in 'official knowledge'? My point is that many individuals would 'agree', as they have hardly been exposed to any contrary views.

The book in its present form is likely to lead the reader to believe that accounting is primarily a technical activity. Even in an introductory book, I would have preferred to see some criticisms and challenges which help to reveal the contradictory and partisan nature of accounting (though the authors in common with the FASB think of accounting as 'neutral'), as this would have created curiosity, interest and appreciation of the fallacies, limitations and diverse nature of accounting. It surely is never too early to begin this. Some parts of the book are too basic for the UK degree accounting courses, whilst others are likely to be unsuitable for the now often acknowledged differences in the institutional framework. For these reasons this book, though a useful addition to UK libraries, is unlikely to appear on many recommended reading lists.

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Prem Sikka

Achieving Economy, Efficiency and Effectiveness in the Public Sector. Cyril R. Tomkins. The Institute of Chartered Accountants of Scotland, 1987. 115 pp. £5.

This publication is the first of an 'Emerging Issues' series which has been initiated by the Research Committee of the Institute of Chartered Accountants of Scotland.

The first chapter questions whether there is a

clear enough distinction drawn between the public and private sectors. Tomkins states that before discussing management in the public sector it is important to form a view as to where the dividing line should come and also to locate that discussion within the context of the broader economic and political debate relating to the control of public sector expenditure. A useful presentation of the arguments is made, using a spectrum of organisational forms which range from 'A: Fully Private' to 'H: Public Without Competition'. He states that, given the recent trends towards 'intermediate' forms of private public control, the focus should be on the appropriate form of management and control for each activity. Chapter 2 provides a brief but useful review of government's recent efforts to improve efficiency and effectiveness in the public sector. Sub-divided into central government, the National Health Service, local authorities, the universities and the nationalised industries, this chapter provides a useful overview for those not familiar with these developments.

Chapter 3 considers what is meant by effectiveness and how we assess it. The chapter concludes with the view that as effectiveness evaluations develop in the UK we shall see the emergence of systems which have both overall quantitative indicators and largely qualitative micro-studies of specific issues—the former approach complementing the latter. The changing nature of accountability is discussed in chapter 4. This discussion is in two parts. Firstly, the various conceptual dimensions of public sector accountability are explored; and, secondly, the situations in both central and local government are examined in turn. In this chapter, Tomkins rightly points out that the pressure for increased accountability was not stimulated by any desire to control legal or ethical behaviour; rather it was stimulated by the economic rationality of the need to achieve better value from a declining level of funding. Chapter 5 concludes by exploring the current state of planning and control as practices in the public sector and relates these developments to recent trends in the literature.

This is a very useful book for all those who wish to become more acquainted with recent developments in exercising greater control over public sector expenditure.

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